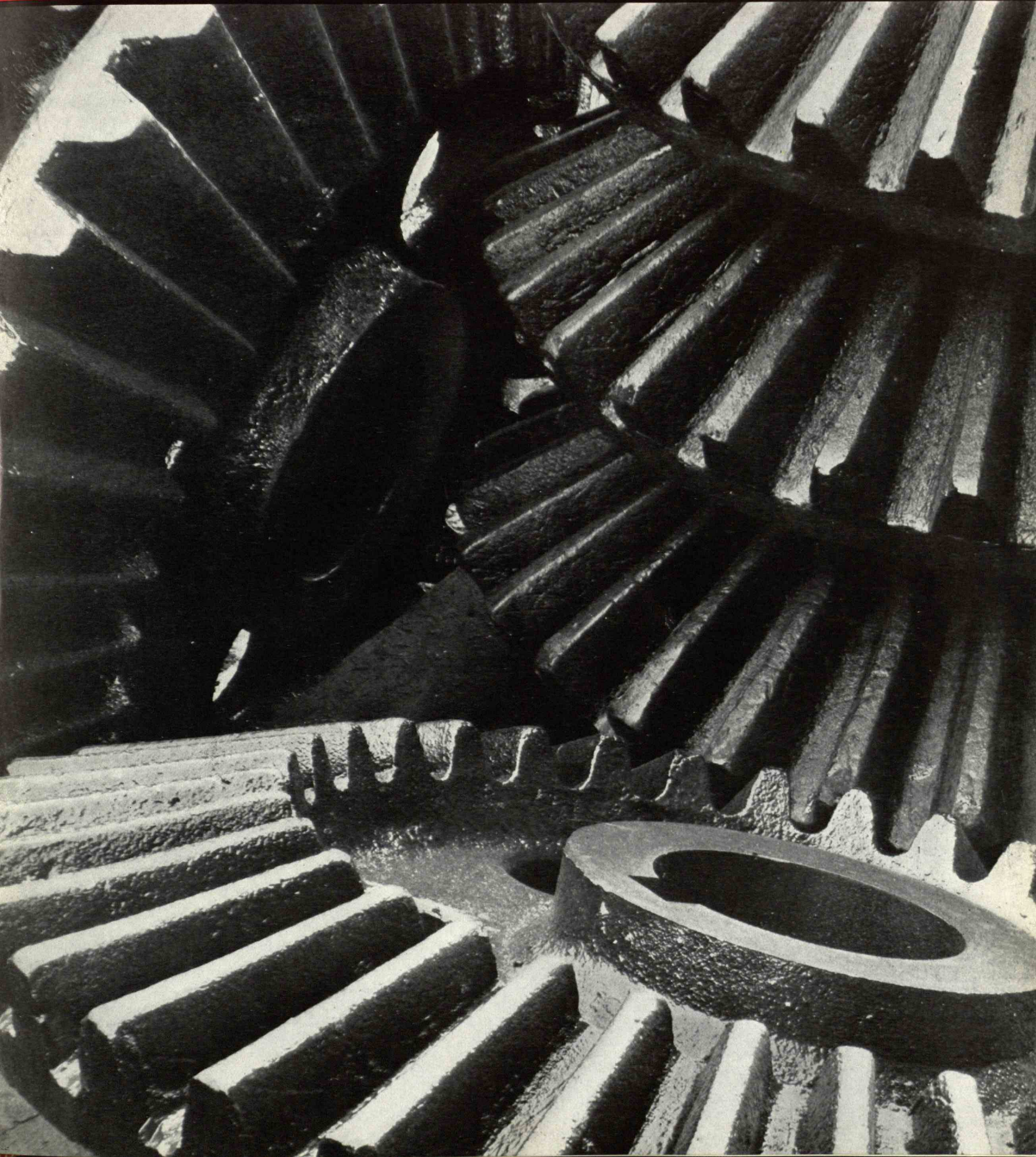


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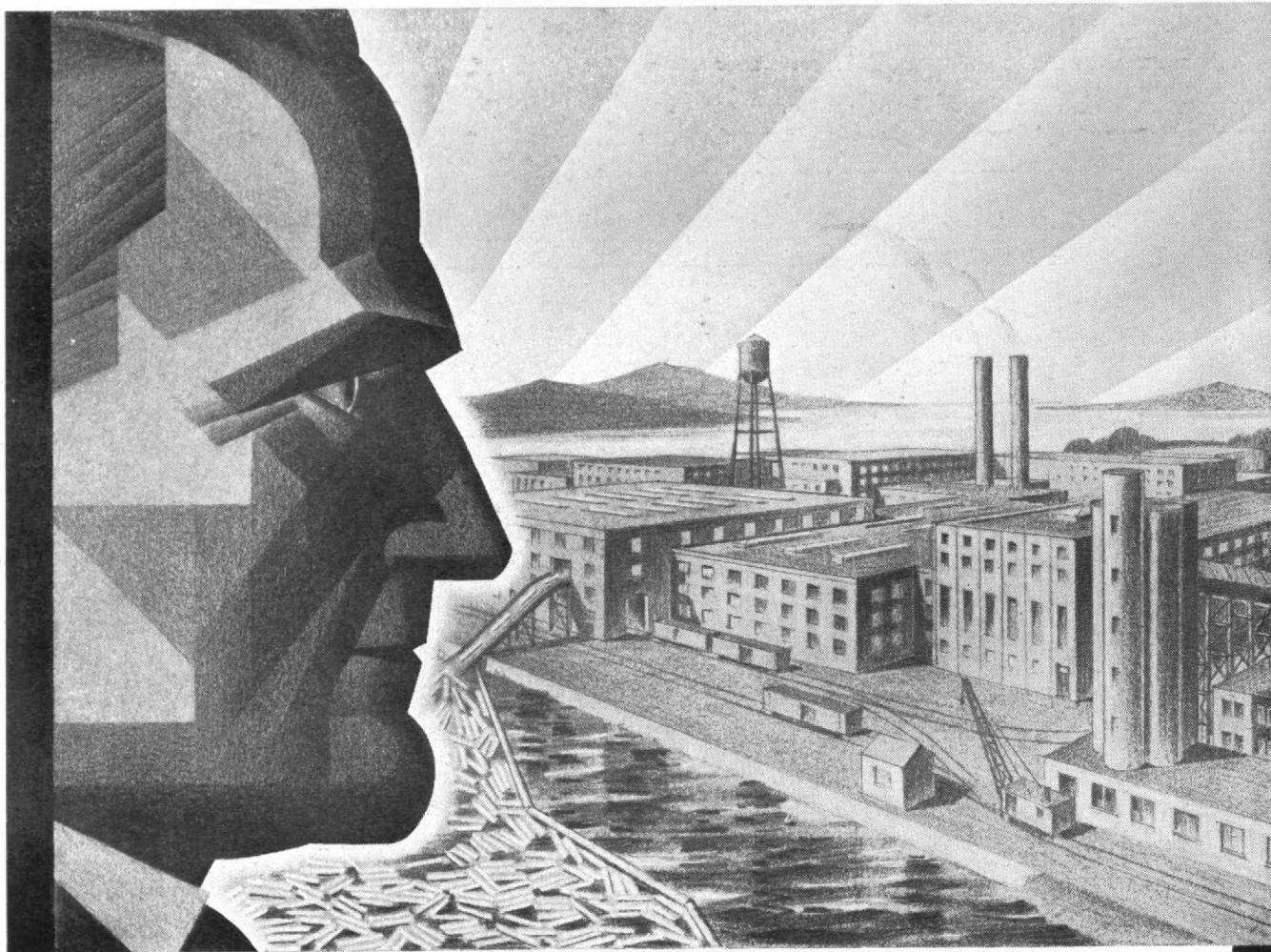
TECHNOLOGY REVIEW



technology review

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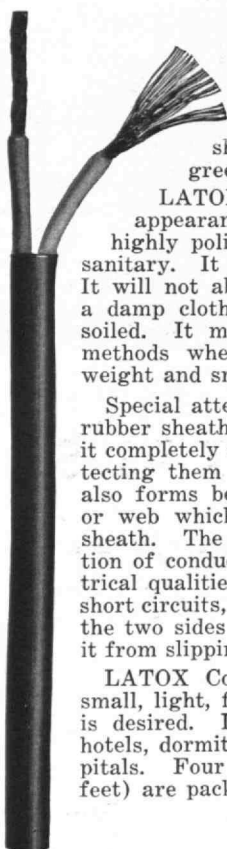
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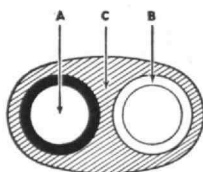
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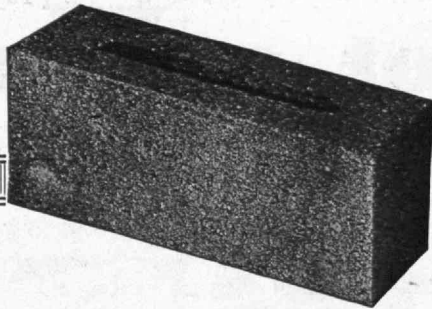
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THE TABULAR VIEW

HENRY NORRIS RUSSELL, author of the article on spectroscopy, page 279, is Director of the Princeton University Observatory and is a Research Associate at the Mount Wilson Observatory. He is internationally famous for his contributions to astrophysics and mathematical astronomy, and has received many scientific awards for his work. President Hibbard, several years ago, remarked that only three men had received Princeton's Doctor of Philosophy degree in physics with the designation of *summa cum laude* — President Compton, his brother, Arthur H., and Dr. Russell. The paper which we present by Dr. Russell is an abstract of a lecture delivered here at M.I.T. under the auspices of the American Institute of Physics during the joint convocation of the American Physical and Optical Societies in February. ¶ The illuminating discussion, beginning on page 282, of German engineering education and of the social position of the German engineer was prepared by two professors of the Technical University at Karlsruhe. DR. THEODOR REHBOCK is internationally known for his contribution to engineering. Among some of his engineering achievements was the designing of the great cantilever bridge across the River Weser. Following this, he traveled to all parts of the world and in coöperation with Fredrich Krupp he made the plans for the defense works at the mouth of the La Plata River and the Bay of Bahia Blanks in South America. He headed an expedition in South Africa which surveyed the possibilities of utilizing its water resources for irrigation. As Director of the Hydraulics Laboratory at Karlsruhe, he has been connected with many great hydraulic projects, pursuing his study of river control and river flow problems, and in the spring of 1929 he lectured at the Institute on his work in these fields. ¶ EMIL PROBST, aside from his work as Professor at Karlsruhe, has practiced as a consulting engineer in concrete and reinforced concrete construction. He is Editor of the magazine *Der Bauingenieur* (Civil Engineer). Dr. Probst is a member of the *Verein Deutscher Ingenieure*, the Society of American Military Engineers in Washington, and Honorary member of the American Academy of Arts and Sciences in Boston.

THE account of George Eastman's relations with M.I.T. on page 284 was prepared for The Review by Carl W. Ackerman, Director of the Columbia University School of Journalism. ¶ In commenting on the death of Mr. Eastman, President Compton said: "The Massachusetts Institute of Technology owes to Mr. Eastman not only the greatest portion of its present material resources, but also reinforcement of its purpose to be of service. First as the 'Mysterious Mr. Smith' and later as its recognized benefactor, this institution has honored Mr. Eastman and has been one of the instruments through which he served his fellow men. The Corporation, Alumni, Faculty and Students all mourn the passing of a great benefactor and a great man."



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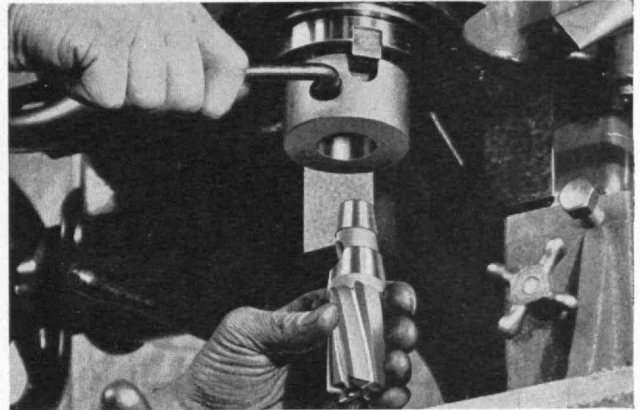
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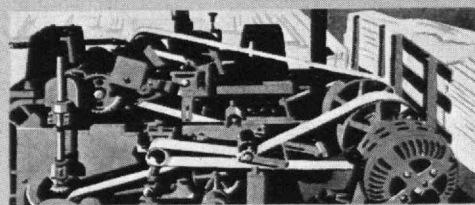
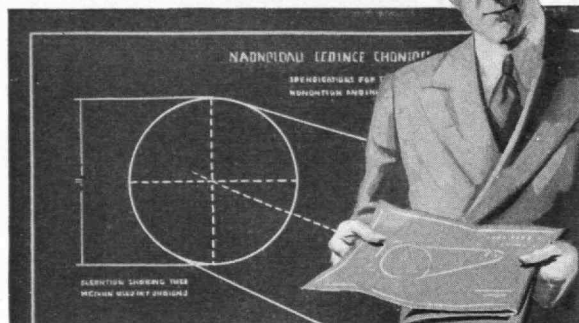
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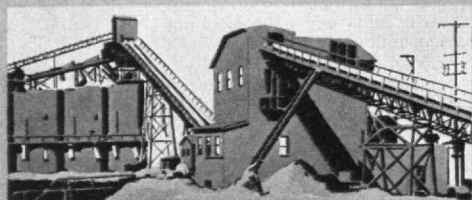
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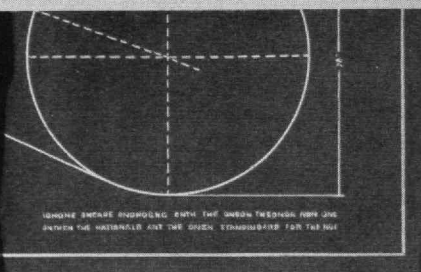
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THE TECHNOLOGY REVIEW

A NATIONAL JOURNAL DEVOTED TO SCIENCE, ENGINEERING, AND THE PRACTICAL ARTS

Edited at the Massachusetts Institute of Technology

VOLUME XXXIV

NUMBER 7

Contents for April, 1932

THE COVER	From a photograph BY MARGARET BOURKE-WHITE	
A FALLING DROP OF MILK	FRONTISPIECE	278
<i>Caught in the Act by a New Method of High Speed Photography</i>		
THE MASTER KEY OF SCIENCE.	BY HENRY NORRIS RUSSELL	279
<i>Revealing the Universe through the Spectroscope</i>		
THE EDUCATION OF THE GERMAN ENGINEER		
<i>The Evolution of the Technical University</i>	BY THEODOR REHBOCK	282
<i>The Problem of Over-Specialization</i>	BY EMIL PROBST	283
GEORGE EASTMAN	BY CARL W. ACKERMAN	284
<i>His Relations with M. I. T.</i>		
FEATHER RIVER TWICE SPANNED		295
<i>An Adventure in Surveying</i>		
NEW ADMINISTRATIVE ORGANIZATION AT M. I. T.		296
<hr/>		
THE TABULAR VIEW		274
<i>Notes on Contributors and Contributions</i>		
THE TREND OF AFFAIRS		289
<i>The Past Month in Science and Engineering</i>		
THE INSTITUTE GAZETTE.		298
<i>Relating to the Massachusetts Institute of Technology</i>		

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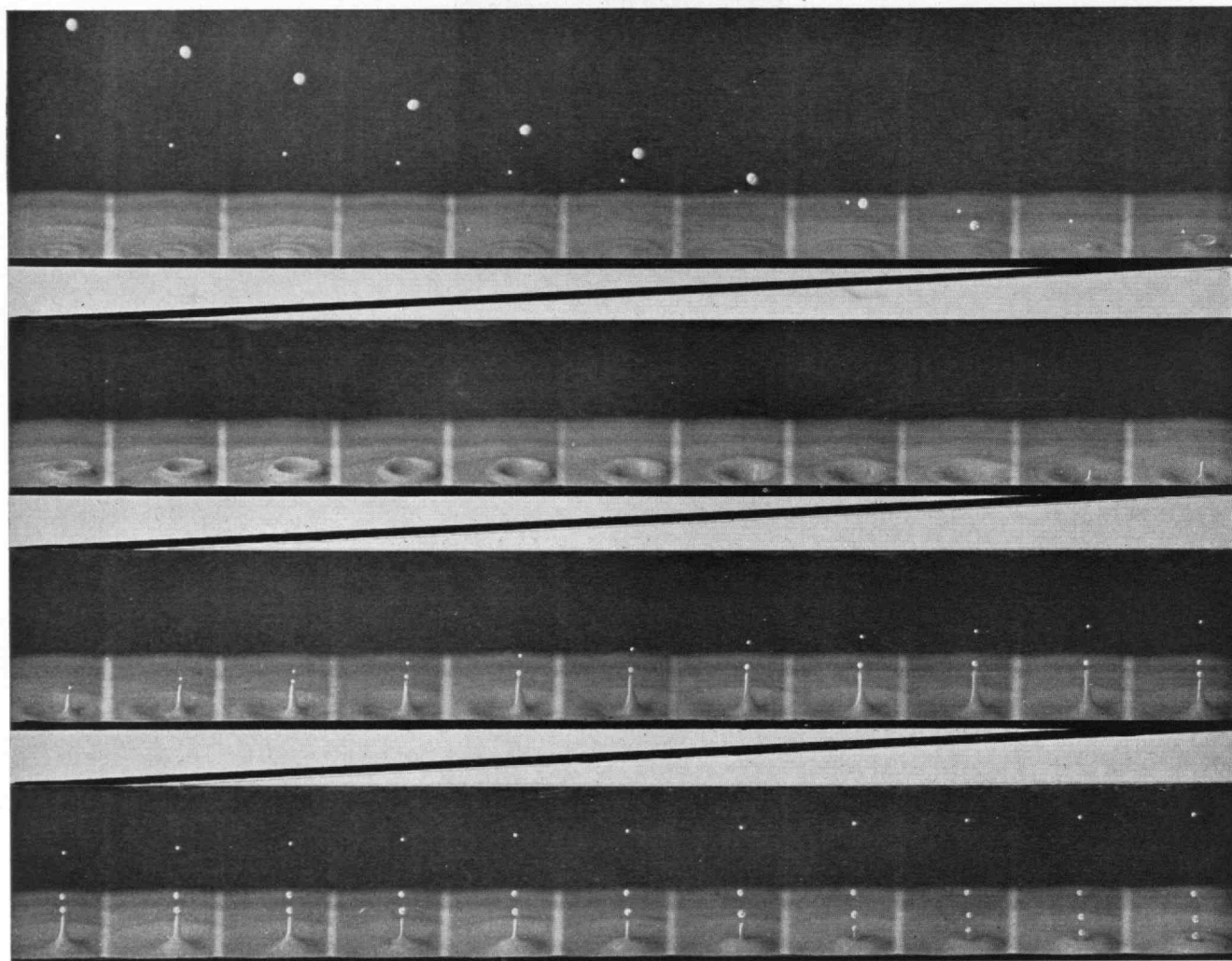
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A FALLING DROP OF MILK

Caught in the Act by a New Method of High Speed Photography



ABOVE is shown, from left to right, row by row, 44 separate, successive pictures of a globule of milk dropping into a puddle of milk. When the drop strikes the surface of the puddle a crater is formed as shown in the second row down. There next occurs a conical growth in the center of a crater which resolved into small droplets bouncing upward as pictured in the bottom row. This phenomenon is not observable by the eye, since it takes place too rapidly.

These pictures which reveal it were taken at a speed of 480 exposures a second or nearly 30,000 a minute. Each row of 11 pictures represents a time interval of about $1/45$ of a second, and the entire sequence shown above an interval approximately $1/10$ of a second.

The camera which was used has no shutter nor any clawing mechanism. The film is simply run through it continuously without stopping for each picture as ordinary motion picture cameras do. The drop being photographed is illuminated by powerful stroboscopic or intermittent light which lasts about

$1/100,000$ th of a second or less for each flash. The instantaneous intensity is sufficient to expose a photograph in this short time and the time of exposure is so short that there is no appreciable blur. In other words, the light is on and off so quickly that a photographic impression of the object is exposed upon the film as though both the object and the film were stationary.

The flashes of light are obtained by discharging condensers through mercury-arc lamps. The circuit is arranged so that the condensers are charged up between flashes. This method of high speed photography has been developed by Harold E. Edgerton, '27, of the Institute's Electrical Engineering Department with the assistance of Kenneth J. Germeshausen, '32.

While there are other methods of high-speed photography with even greater speed, they are complicated and expensive in contrast to the extreme simplicity and portability of this one. The stroboscopic method is finding a great variety of uses in industry, particularly for observing the operation of high-speed machinery, and in making motion studies.

THE TECHNOLOGY REVIEW

Vol. 34, No. 7



April, 1932

THE MASTER KEY OF SCIENCE *Revealing the Universe through the Spectroscope*

BY HENRY NORRIS RUSSELL

THE great French philosopher of the last century, Auguste Comte, was an exceedingly well informed and versatile man, but it was he who once remarked: "There are some things of which the human race must forever remain in ignorance; for example, the chemical composition of the heavenly bodies." To Comte and the other intelligent men of his time, this problem seemed hopelessly insoluble; there was no way of attacking it.

Of course this statement sounds ridiculous to us now. It became ridiculous because man's dream came true of a master key that would unlock many doors, one after another, and so open up many new realms of knowledge.

That master key was the spectroscope. No sooner was it discovered than the composition of the heavenly bodies, previously unknowable, became an open book. With its use, many of the familiar chemical elements were identified in the sun, and not long after, in the stars. Later work has extended the number of elements identified in the sun to sixty, and spectroscopic study has shown that the atmosphere of Mars contains oxygen and water vapor, while that of Venus shows no signs of them.

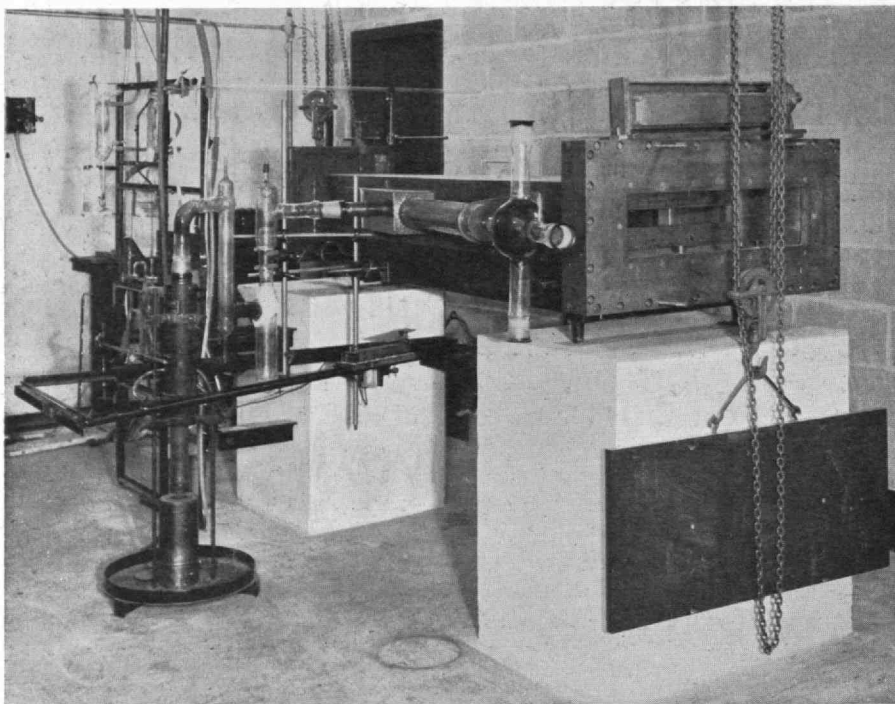
All the stronger lines in the spectra of the sun and stars and a host of the weaker ones have been identified. It has been demonstrated that the same atoms are present on earth that are also present in the remotest nebulae, in the relatively cold tail of a comet, and in the intensely heated surface of a white star. By showing these things, the spectroscope has given the most impressive of all proofs of the unity of nature.

This achievement has been described in poetry, as it should be, by Edmund Clarence Stedman, in one of his more philosophical poems "Corda Concordia." The stanza in which this is done is such good science, as well as such good poetry, that I would like to quote it:

"White orbs like angels pass
Before the triple glass,
That men may scan the record of each flame, —
Of spectral line and line
The legendry divine, —
Finding their mould the same, and aye the same,
The atoms that we knew before
Of which ourselves are made, — dust, and no more."

It is more than two hundred years since Newton, passing his beam of light in a darkened room through a prism, saw the rainbow-colored streak of light upon the wall as the rays of different color were refracted in different amount by the prism, and so was led to realize the composite nature of white light. Unfortunately, Newton took his light through a small round hole and he took it from the large round sun; consequently, even if the sun had been all one color, the image that he would have had thrown on the wall would have been like the image that he got when it came through a pinhole in the window shade. If only he had had the wit to set up a narrow slit so that the image would have been sharp and not round, the master key might have been discovered.

Just after the first half of the Nineteenth Century was over, Kirchoff and Bunsen made that simple but fundamental mechanical change. Really this master key was



M. I. T. Photo

A vacuum spectrograph used for studies in the extreme ultraviolet region of light. It was developed from a design of President Karl T. Compton, of M. I. T., with the assistance of Dr. Joseph C. Boyce, a Research Associate in the Department of Physics. It is in the Spectroscopic Laboratory at M. I. T., a "Science Wonderland," which "represents the heaviest artillery yet concentrated by Science for assaulting the citadel of the atom"

found in a narrow slit — simply in letting your light into this prismatic instrument through a slit so narrow that you obtained a sharply defined image. As soon as that was done, as soon as they took the light through a narrow slit into their prism, with an eyepiece to look at it and a couple of other lenses to make the light go in parallel rays through the prism — the new doors were opened and the new worlds free to conquer.

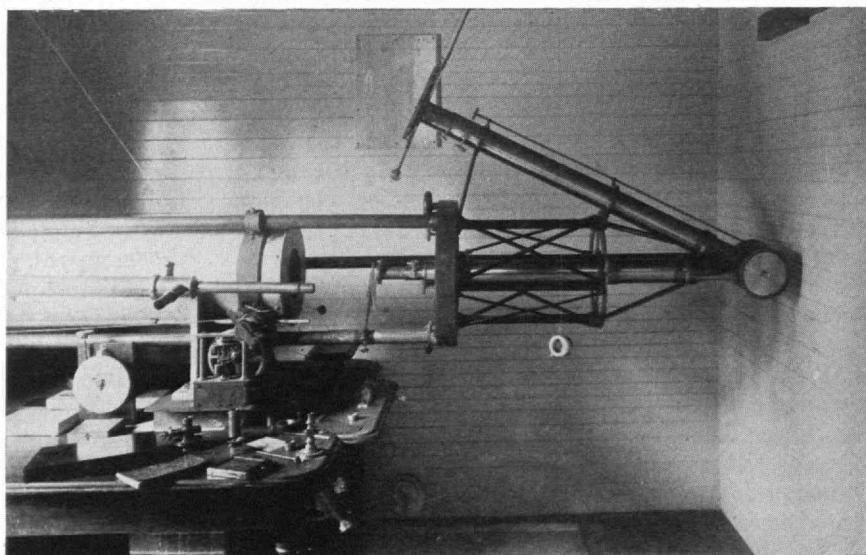
The next necessary advancement was the development of a more delicate method of spectrum analysis. This came with Rowland, the great Johns Hopkins physicist in the Nineties. He developed an engine for ruling diffraction gratings, the device that is used for breaking light up into its components. The best of Rowland's gratings are the joy, the envy, and the despair of the investigators today — the joy of the man who has one, the envy of his colleagues, and the despair of the man who tries to make one as good. Rowland devoted years to the study of the solar spectrum and reported and recorded in it the position of 20,000 lines, each one carrying its own story of some substance in the sun. When Rowland was through his work, thirty-six of the chemical elements had been identified in the sun. Since that day, of course, a number more have been added because plates have been developed which are sensitive to the red end of the

spectrum, and Rowland had no such plates available. Partly for that reason, and partly because some substances are now available of which Rowland could not get specimens, sixty chemical elements have now been identified in the sun — most of them with certainty.

In the stars, we cannot observe such immense detail as we can in the sun, although the big spectroscopes that are now being attached to the great refractors such as the Mt. Wilson 100" telescope give us an amazing amount of information, and dozens of different chemical elements have been definitely identified in the stars.

The minute shift in the position of the lines due to motions of approach or recession has enabled us to detect and measure the rotation of the sun and the planets, to prove that Saturn's rings are not solid, but composed of myriads of tiny satellites, and to get one of the most accurate determinations of the sun's distance.

Applied to the stars, it has determined the sun's motion among them, the distances of hundreds of individual stars, and the average for thousands more; has revealed hundreds of double stars too close to be resolved by the telescope, and determined the masses and even the diameters of some of them; and has disclosed those amazingly rapid motions of the remote nebulae — some as high as 15,000 miles a second — which point the way to new conceptions of the nature, the past and the future of the material universe. Spectroscopic tests have shown that the nebulae are of two kinds, one consisting of masses of luminous gas; the others, giving light

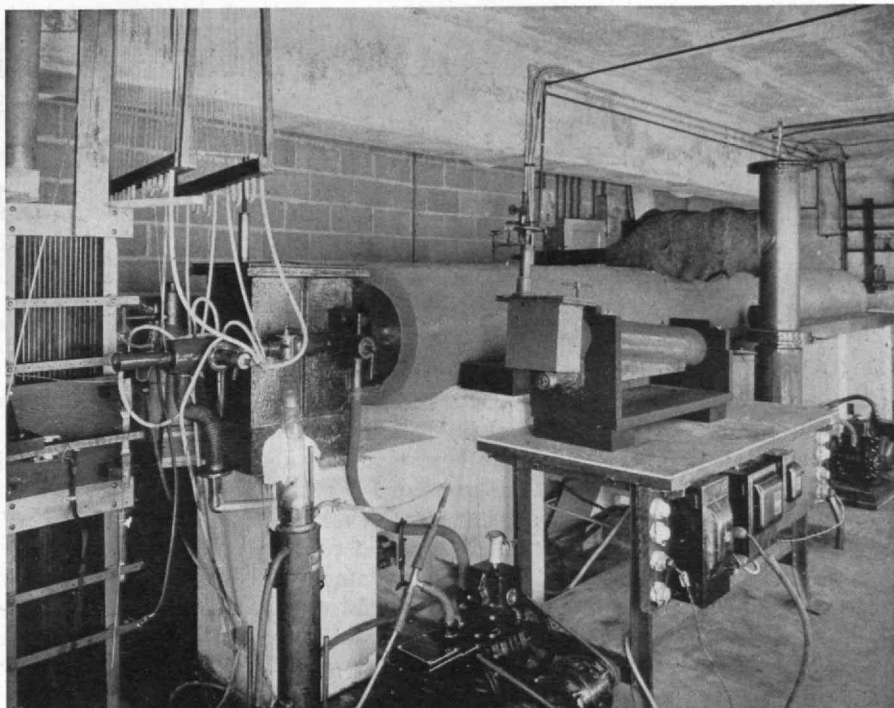


The spectroheliograph invented by George Ellery Hale, '90

like stars, must themselves be great clusters of stars at gigantic distances.

If the spectroscope has thus proved so profitable to the astronomer, what has it accomplished for scientists in other fields? The chemist owes to spectroscopy the discovery of at least ten of the elements, some by optical methods, others more recently by the aid of x-rays. Among these is helium which was detected in the sun and its nature as a light gas correctly interpreted more than twenty years before it was "run to earth."

The classical physicist finds in the spectroscopic data his most precise standards of length, and some of his more accurate methods of measurement. My friend, Dr. Meggers, of the Bureau of Standards, and his associates have developed this use of the spectroscope recently. Suppose, for example, you have some fusible plugs that are used in our overhead sprinkler systems. They are made of a fusible alloy which will be greatly damaged if it has any more than the most minute quantity of iron in it. To find this out by chemical analysis is a slow and tedious process; but you can take one of these plugs and test it with the spectroscope,



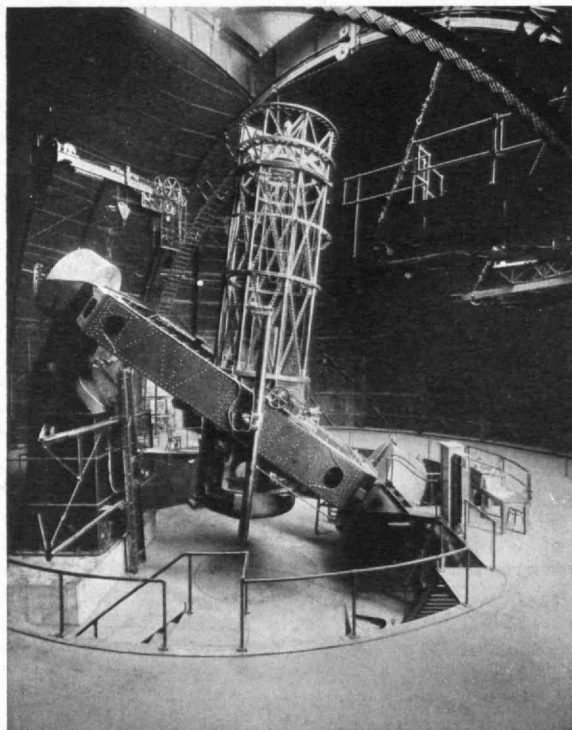
M. I. T. Photo

The great 21' vacuum spectrograph at M. I. T., the largest ever built. It was designed by Professor George R. Harrison, Director of the Spectroscopic Laboratory. When the cylinder is evacuated, the force exerted by the atmosphere on the outside is approximately 88 tons. The size of this huge spectrograph is indicated by comparing it with the one on the table which is of the size customarily used in this field of research

and if the strong lines of iron show up, you know there is iron there. Comparative tests with materials of different composition give you an idea of the safe limits. Thus, with the spectroscope you can test these alloys in a minute part of the time that chemical composition requires.

But it is in the realm of atomic physics that spectroscopy has played its greatest rôle. Fifty years ago, Lockyer, from a study of the spectra of electric arcs and sparks, and of the stars, concluded that, in the spark and in the hotter stars, ordinary atoms are decomposed into products which give different spectral lines. This bold generalization was fully justified forty years afterward, by the development of the theory of ionization.

About forty years ago, series of lines were detected in many of the simpler spectra, and found to be representable by formulae in which the "Rydberg constant," common to all spectra, appeared. Here was evidence of some uniform feature in the constitution of the different atoms. The Zeeman effect, according to which a spectral line emitted by a source placed in a strong magnetic field is split up into polarized components, again showed features common to different atoms, and suggesting the presence within them of moving electrical charges. The Bohr-Rutherford theory of atomic structure — with electrons in orbital motion around a nucleus — was based very largely on these spectroscopic data. It accounted at once for the typical spectral series of hydrogen, and accurately predicted other series in the infra-red and ultra-violet. With simple modifications, it explained the more complicated system of series in the spectra of the alkalis. The multiple character of the terms of the series was later (Continued on page 300)



The great Hooker 100'' telescope at the Mt. Wilson Observatory. It has been enormously valuable in spectroscopic research

The Education of the German Engineer

The Evolution of the Technical University. Its Success in Training for Leadership

BY THEODOR REHBOCK

A CENTURY ago there were in Germany no engineers with technical university training, since the higher German technical institutions which provide an education based upon mathematics and the natural sciences have existed little more than 100 years.

Prior to this time, technical experts were developed only through practical, professional life. In that period it was difficult in Germany to adapt fundamental, theoretical knowledge to technical fields of endeavor. An illustration of the extraordinary obstacles met with by progressive engineers before 1825 (the year of the foundation of the polytechnic school, later the *Technische Hochschule*, or Technical University of Karlsruhe) is shown in the development of Johann Gottfried Tulla, the man who first saw the need for technical universities in Germany. His sovereign had commissioned him with the regulation of the waters in the country of Baden, in particular of the Rhine, to protect the land from the heavy damages of the uncontrolled rivers.

To obtain the necessary theoretical knowledge, Tulla was sent abroad by his ruler to a prominent mathematician for private instruction, whereafter he engaged in practical surveying projects on the lower Rhine, followed by considerable traveling in other countries. Finally, to complete his training, Tulla studied at Paris, where higher technical instruction methods had first been developed and were already well advanced by the end of the Eighteenth Century.

Not until after long years of tedious and expensive training could Tulla undertake the organization of river and highway construction in his native Baden, together with the direction of one of the greatest river-hydraulic projects of all times: the regulation of the Rhine from Basel to the mouth of the Neckar. The latter undertaking has given the great river a continuous, closed bed which it has harmlessly followed throughout the past 100 years.

For this stupendous project Tulla needed engineers who were well trained theoretically. Together with a comrade, the architect Weinbrenner, he made the first move towards founding a higher technical school at Karlsruhe. Following the lead of Karlsruhe, a series of higher technical institutions developed, from which came numerous engineers with superior technical knowledge. The education of these engineers was specialized to a great degree, lacking in many respects the breadth of knowledge obtained by the graduates of the older universities.

At that time graduates in law governed almost entirely the public life of Germany, occupying the leading positions in the administration of land and community.

Fifty years ago, it was accepted as practically matter-of-course that even great technical concerns should be directed by attorneys and governmental officials.

Engineers of higher scientific education in Germany have conducted a long and heavy battle to alter this situation and win for themselves full equality with the other professions, in particular, law, which clung tenaciously to its prominent, powerful position over a century of development. These engineers, turning their entire vigor to technical problems and still sadly lacking in breadth of comprehension and social cleverness, could make but slow progress, especially as the lawyers had the advantage of coming from families of the same profession, for (Continued on page 304)

TRANSLATOR'S

In the adjacent articles Professors Rehbock and Probst discuss for readers of The Review several of the more prominent transformations now occurring in the German educational system, noting the increasingly important rôle taken by German engineers in public and social affairs.

It must be realized that these discussions deal with only the Technische Hochschule, which provides Germany's highest form of technical education. There also exist in Germany technical trade schools, which correspond somewhat to our coöperative courses here at the Institute, but do not give the same degree of theoretical training. The Technische Hochschule, on the contrary, probably exceeds the average American engineering institution in its fundamental instruction in physics, mathematics, and mechanics, retaining this theoretical attitude throughout the more practical undergraduate courses. Instruction is offered entirely through the lecture system, together with the necessary laboratory and design work—in all of which the student is allowed the maximum of freedom and independence.

Hence the German system caters more to the exceptional student, as opposed to the American method of developing the majority perforce to a standard set by the average undergraduate. This underlying principle might be seen from an anecdote often related about Bismarck; he was reproached for the German educational methods by the statement "Half the students in your universities loaf their time away." "To be sure," he retorted, "but see what the other half is accomplishing."

However, altogether too pertinent to be ignored is another problem which has faced Germany throughout the past decade, a problem which we in America are just beginning to face as President Compton pointed out in the last issue of The Review. In recent years a steady decrease in employment has accompanied a growing registration in the technical universities, with the obvious result that the land can offer positions to only a small portion of the graduating engineers. Depression may account for a fair share of this increase, for tuition is surprisingly low; but German students too are adopting the lamentable American atti-

and His Battle for Public Recognition

How Educational Defects Limit the Engineer. The Problem of Over-Specialization

BY EMIL PROBST

THE education of the German engineer — when one considers the leading engineer — for both profession and life is fundamentally different from that of the American, as are also his later place in life and his ultimate goal.

For the majority of American engineers, there exists as a final goal the position of independent consulting engineer at the service of governmental and industrial authorities, by whom they are enlisted as confidential advisers and given far-reaching power and responsibility. In Germany, however, this branch of the profession is encountered only in exceptional cases. For a long time it has been the aim of many German engineers to obtain permanent state positions in order to secure for

themselves and their families a reliable occupation. Others choose paths which lead to the direction of concerns for contracting or for engineering management, or of other branches of industrial enterprise.

Before the German engineer begins his specialized education at the *Technische Hochschule* (technical university), he has to complete at least 13 years of general schooling, making him some 20 years of age when he arrives at either the university or the *Hochschule* to start his professional training.

But it must be admitted that both in German economical and technical professions the opinion is widely spread that confining youth to the school desk over so long a period must be a fault of organization. Hence the question of reorganization has arisen again and again during the past two decades.

It must be remembered that general opinion is against the qualitative weakening of the basic education in the preliminary (*Volkschule*) and secondary schools (*Gymnasium*, *Realgymnasium*, *Realschule*). More than ever before, the engineer of today and tomorrow must be capable of presenting his own ideas and those of his co-workers in adequate form, if he is to attempt the leadership of governmental or important private ventures. He must be, therefore, in a position to express himself accurately and command his mother tongue in both speech and writing; and next to securing the foundation in natural sciences, he must study foreign languages in order to be able to give heed to international relations.

These indispensable qualifications of the modern, educated man are often lacking, since the school curriculum is overburdened with irrelevant subjects. A number of general preparatory schools still delight in the point of view that without Latin and Greek one may never hope to become cultured. The result is that there are schools in which the Latin and Greek courses predominate to the detriment of other requisites. Whether it will be possible to shorten the time spent in the preparatory schools is questionable, for our desire is rather to deepen the general education than to weaken it. At all events, serious efforts are being made to secure a uniform preparatory course both for the technical school and for the university.

Here attention must be called to a general misunderstanding in America, where the name *Technische Hochschule* is often mistaken for "high school." The latter is, in German, *höhere Schule*. *Technische Hochschule* is identical with university, of which, however, it is independent. There are, nevertheless, serious thinkers who hold the assimilation of the former by the latter, as in England and (Continued on page 303)

PREFACE

tude that a college education is the primary essential of worldly success.

Three years ago the Verein Deutscher Ingenieure (Society of German Engineers) published an article bewailing this useless overcrowding of the technical field, with the earnest recommendation not only that no new technical universities be founded, but that the matriculation in those already existing be restricted. A number of pertinent facts are to be noted in the following excerpts from this article:

"More than ever before are young people thronging to the higher schools. They hope in this way to insure for themselves an especially desirable place in life by overcoming a few difficulties during undergraduate days. Ignorance of the actual employment outlook and an overvaluation of the social advantages of the learned professions are the real causes of this situation — and not, perhaps, only a love for Science. . . . The overrating of school knowledge is involved with an equally false overrating of what man learns in practical life. History and our own experience show how important the school of life is to professional success.

" . . . among a terrific number of employment seekers (cases are named of 300 and more applications for a single position) often only a few really capable men are found. This proves that the percentage of outstandingly qualified young men among a given number of the population may not be appreciably increased by mass enrollment in the higher schools. The overcrowding of the universities has, on the contrary, a narrowing effect upon the educational possibilities. Hence it must be accepted as an established fact that this thronging to the technical schools is not a result of the real need for academically-trained engineers, but instead of the unhealthy overestimation of the value of a university education. . . . Not only college diplomas and the accompanying qualifications they represent, but above all else a man's performance both before and after — this must be the standard of qualification for the engineering profession."

HUNTER ROUSE

GEORGE EASTMAN

BENEFACTOR OF EDUCATION

*"The Mysterious Mr. Smith" Whose
Interest in M. I. T. Extended Over
Nearly Half a Century*

BY CARL W. ACKERMAN

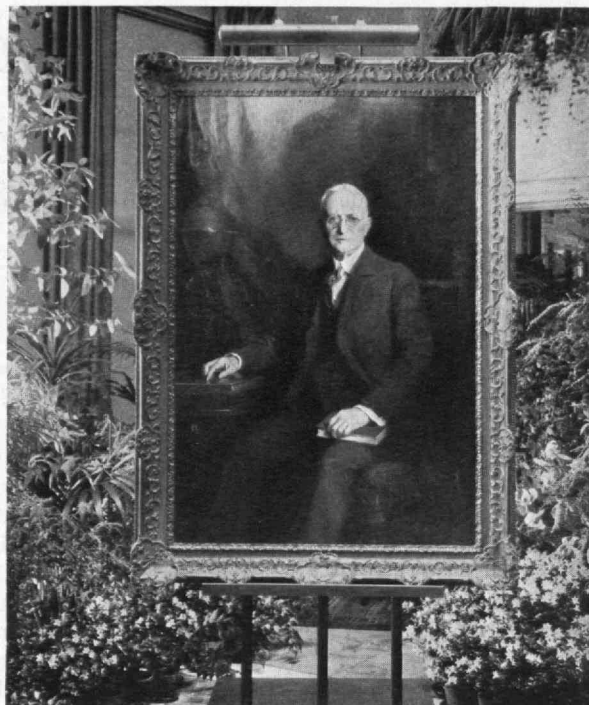
*His Death on March 14 Was an Irreparable
Loss to Industry, to Science,
to M.I.T., and to the World*

ONE of the paradoxes of the last half century of progress in the United States is the contribution which self-educated industrialists have made to the progress of education. This has not been exclusively financial, especially in the case of M. I. T., for George Eastman's interest in this institution covered a span of more than 40 years and during the greater part of this period he was an inconspicuous and detached student and beneficiary.

During these years of industrial expansion in the United States, graduates of Technology came in increasing numbers to Rochester and to other industrial centers. As Mr. Eastman observed them and studied the annual reports of Technology, he became convinced that "the progress of the world depends almost entirely upon education." Then when he reached the distributive period of his own life, he was prepared to coöperate with and to encourage President Richard C. Maclaurin in building the Institute of Technology as it is today.

Mr. Eastman himself never sought nor desired recognition. Early in his own career he had become convinced that "individuals may form communities," as Disraeli observed, "but institutions alone can create a nation." If Mr. Eastman could have distributed the bulk of his fortune as secretly as he did his income, it is doubtful whether his identity as "Mr. Smith" would be known today.

After inventing film photography and the portable hand camera, Mr. Eastman turned his attention to the need for scientifically trained men in industry. As a result of his own analysis and observation, for he himself was not a graduate of any school, he decided to apply to Technology for a young engineer who could take charge of the construction of a new plant outside the City of Rochester. In accordance with this plan, Mr.



*The de Laszlo portrait of George Eastman (1854-1932)
which hangs in the Corporation Room at M. I. T.*

Eastman asked Professor Thomas M. Drown, Richard Perkin Professor of Analytical Chemistry, to recommend a young chemist from the graduating class, expressly stating the following: "I do not want anyone who is not painstaking, thorough, and thoroughly reliable. Harum-scarum youths are not of any account in this business." And then he added a sentence which was the foundation for four decades of continuous interest in Technology: "I have a great deal of confidence in the material you turn out at your institution."

That was in 1891. During the succeeding 21 years Mr. Eastman observed the industrial asset value of technically trained men. Following closely Dr. Maclaurin's administration, he remarked casually to Frank W. Lovejoy, ['94] his general manager, that he would like to meet the President of Technology. On March 1, 1912, President Maclaurin's first letter reached Rochester. It read as follows:

A few weeks ago I had the pleasure of spending a morning on a visit to your Works at Kodak Park, and was so much impressed by what I saw that in public addresses and private discussions ever since, I have referred to these Works as a striking illustration of how a great modern industry has been built up by the application of scientific methods to manufacturing, business, and the arrangement of buildings. My experience in Rochester was incidental to a visit to Alumni Associations of Technology in various states — a visit projected with the object of interesting the Alumni of this Institute in the great problems of development with which it is now confronted.

The Institute was founded 50 years ago for the purpose of training men to apply modern science to industry in all its phases. It began in a modest way and has steadily grown in size and influence until today its power is felt all over the land, and its graduates are found everywhere contributing to the national wealth by their trained intelligence and skill.

It began as a local institution, but is now a national one, with students in large numbers from every state in the Union, and over a hundred from foreign countries. The Alumni, who know it best, are enthusiastic as to its accomplishments, but they may perhaps be too near to take a proper perspective of its real importance. However, there is no lack of testimony from unprejudiced sources as to the value of the Institute's training. Thus, Sir William Mather, a prominent business man in England, reported to a Royal Commission in London with reference to this Institute, as follows:

"The spirit and energy of the students, their conspicuous practical knowledge, the thoroughness with which their scientific knowledge is tested in the course of instruction, and the power of adaptation and resource they possess on entering workshops and manufactories, railroads, or mines, public works and constructive engineering — all these fruits of the training of this Institute are, so far as I have seen, not equalled on the Continent. I think these are the qualities we need in England."

A few months ago, Dr. Bryce, a distinguished educator from Canada, stated that after visiting all the leading technical institutions in the world, he could say unhesitatingly that no technological school was to be found anywhere ahead of the Massachusetts Institute of Technology. And Mr. Edison has very recently said: "For 40 years I have been employing young men. I have taken them immediately upon graduation from technical schools and set them to work in my mills and I have found that the graduates of the Boston Tech have a better, more practical, more useful, knowledge as a class than graduates of any other school in the country. If every state in the Union had such a technical school, it would be a great thing for this country. It would bring our national problems far nearer to solution; it would improve our business conditions; and it would teach us how to grapple with the evils of the day in a competent and sane manner. There is no question but that the Massachusetts Institute of Technology is the best technical school in the country."

The steady growth of the prestige of the Institute has had the natural effect of increasing its numbers beyond the limits of its capacity, in spite of its high fees, until today its present equipment is inadequate for the demands that are made upon it. It has, therefore, been deemed expedient to provide adequately for future expansion by removing the Institute to a new site, where it can grow freely. A site of 50 acres has been purchased in the very center of greater Boston — a tract of

land with a frontage of a third of a mile to the Charles River Basin. This site is ideal for the Institute's purposes, near to the heart of things, wonderfully accessible from all points of the city and surrounding country, and occupying a position that commands the public view and must command it for all time. Having purchased this site, we are now making a careful study of the problem of rebuilding, and have been fortunate in securing the services of one of the most prominent engineers of the country — Mr. John R. Freeman [76] — to assist us with the engineering phases of that problem. We realize that we can learn much from commercial buildings of the better type, in the erection of buildings that are carefully planned so as to meet the actual needs of the Institute. These buildings must be worthy of a great institution of learning, but, though dignified, they must be simple, and they must be arranged so as to give the maximum of convenience for the minimum of cost, due attention being given to fundamental problems of lighting, heating, ventilation, and the like. In carrying out this work of rebuilding, we shall have the assistance of an enthusiastic body of Alumni, but the growth of the Institute has been so marked in recent years that considerably more than half its graduates have gone forth within the last decade. This means that they are a very young body of men, and consequently that few are in a position to help in any very large way financially. Fortunately, there are in the country men of large vision who appreciate the national importance of such institutions, and are ready to help where they are convinced that encouragement is deserved. A recent communication from Mr. Frank W. Lovejoy suggested that you may be ready to lend a helping hand, and I am writing to say that I should welcome an opportunity of placing our plans before you. I should gladly visit Rochester, if a time could be arranged that would be mutually convenient.

In reply Mr. Eastman suggested a meeting at the Hotel Belmont in New York City. Here these two men met for the first time, Mr. Eastman with an Oriental capacity to conceal his thoughts, and President MacLaurin with his Occidental enthusiasm and confidence. Dr. MacLaurin related the story of Technology's half century of educational effort, cramped now by a lack of adequate facilities and funds. He painted his picture on such a vast canvas and in such a manner that it appealed to Mr. Eastman's imagination; so much so, that he

Mural paintings decorating the Eastman Theater of the Eastman School of Music, Rochester, New York. The new Physics and Chemistry Building now being completed at M. I. T. is known as the George Eastman Research Laboratories



almost missed the midnight express back to Rochester. If Dr. Maclaurin failed to sleep at all that night it would not be surprising, for he had found "Tech's Santa Claus," a man who wanted to help, and who asked nothing in return.

"When I first came to Technology," Dr. Maclaurin recalled later, "and had time to take observations, I found that the Institute was in the doldrums. It wanted to move, but couldn't get a move on. It was clear that someone was needed to give a real push; and so, after consultation with my colleagues, I went to describe the situation to [T.] Coleman du Pont '84, then President of the Alumni Association]. I described the broad features of our condition and said that we must move to a new site. He asked what sites were under consideration and wanted a brief description of each.

"The first one I mentioned was 25 acres in area. He said: 'Can't you double it?' and I said: 'Not this particular site.' 'Well,' he said, 'I don't like the look of 25 acres. It seems to me too small. Almost invariably when a man comes to me to approve plans for a new factory [du Pont was then President of E. I. du Pont de Nemours and Company], I tell him to double the size of everything, and almost invariably I wish afterward that I had used a larger factor of safety. Technology will occupy a great position in the future and must have room to grow. I don't feel much attracted by 25 acres, but I should be interested in 50.'

"I agreed with his policy, but told him, of course, that the main obstacle was cost. 'What would 50 acres cost?' he asked. I told him 'three-quarters of a million' and he said he would contribute half a million."

AT THEIR epochal first meeting in New York Dr. Maclaurin and Mr. Eastman went over the whole matter carefully, making the best estimates that were possible at that early stage as to the probable cost of the various portions of the undertaking. "At this meeting," said Dr. Maclaurin, "as at many others since, I could not fail to be impressed with his capacity to go to the heart of a problem quickly and see immediately what the main points are and to keep to those points in later discussion.

"He was interested in Technology's problems, but made it clear that his continued interest would depend upon its problems being tackled in a bold way and in a liberal spirit. . . . He likes things done well, but does not think they are well done unless they are done economically."

Mr. Eastman's first commitment, recorded in a formal letter March 6, 1912, was accompanied by a personal note that his name was not to be made public or mentioned to anyone.

"In confirmation of our conversation in New York yesterday, this is to say that I am prepared to give the Institute, as a building fund, the sum of two and one-half millions of dollars; the money to be used exclusively in building suitable buildings for the Institute on the new property which has been acquired by the Institute on Massachusetts Avenue, fronting on the Charles River basin. . . .

"No conditions are made as to the architecture of the buildings to be constructed, but this subscription has been made after listening to your expressions as to

the inappropriateness of the Institute's indulging in any extravagant architectural features and the desirability of getting breadth of effect, more by the proper grouping and general design of the buildings than by elaborate details. One of the objects of this subscription is to enable the Institute to lay out and treat the undertaking as a whole, thereby possibly getting better results than if the buildings were erected at widely different dates."

When Dr. Maclaurin informed the Executive Committee of the gift, the largest in the history of the institution, he added that the man's name was "Smith," just "Smith" he said, with scarcely a twinkle in his eyes, and then he hastened to write Mr. Eastman that there would be no clues as to his identity in Boston.

"What I desired to avoid as far as possible," Mr. Eastman replied, "is the notoriety which oftentimes accompanies such gifts."

Of course the gift itself was not a secret. It was too valuable as a campaign wedge to justify concealment. As soon as it was announced a great guessing competition started which ran the rounds of the newspapers of the country. The competition was revived as a popular pastime on every occasion when another substantial contribution by "Mr. Smith" was announced. "At the time of the dedication of our new buildings," Dr. Maclaurin reported, "suspicion centered on two New York millionaires, each of whom strongly suspected the other. It is said that they dined together to have it out, but separated without having discovered any secrets and with enlarged respect for the bluffing power of the other. As a matter of fact, neither was 'Mr. Smith.' In another center a man, not 'Mr. Smith' claimed to be he, and in still another a woman made it known to her friends that she was certain that 'Mr. Smith' was her husband, although here she was in error."

"I have seen some of the clippings from the Boston papers containing accounts of the attempts to locate the donor and have found them very amusing," Mr. Eastman wrote Dr. Maclaurin. "The matter has quieted down now so that it looks as if the secret might be kept for some time yet, perhaps indefinitely. I am sure it would cause me considerable annoyance if my connection with the affair were made known and as I cannot see any particular advantage to be gained by so doing, I shall be happy to let the matter stand as it now is.

"I do not see why you should not take all the time necessary to perfect your plans before building, particularly as I have fixed it so that in case of my death you will get the money just the same. It is not often that an old institution has a chance to plan an entirely new outfit and it is evident that there is an opportunity to obtain a very high degree of efficiency in the layout, which, with all the talent at your command, you will no doubt succeed in doing."

Throughout the years that his business grew, Mr. Eastman recognized not only individual contributions but the larger indebtedness of industry to education. He believed that, in the future, the relationship between the two would be even more important, that the welfare and prosperity of the nation would depend upon the

coördination of industry and education to encourage extensive and intensive original thinking. To foster this ideal was his fixed decision.

After exchanging letters in regard to the architecture of the new buildings, Dr. Maclaurin went to Rochester again in June, 1913.

"In confirmation of our conversation of yesterday," Mr. Eastman wrote on June 9, "I agree to increase my subscription to the Institute building fund five hundred thousand dollars, making it three million dollars total. The object of this is to secure the completion of the whole main building as contemplated by the latest plan which you have shown me, these plans having developed a necessity for about 12,000,000 cubic feet capacity instead of 10,000,000 as originally talked and also providing for the use of Indiana limestone as a facing material on all outside walls except those which are intended to be masked by the School of Naval Architecture and by future extensions. It is understood that if the total expense runs over the amount of my subscriptions, the Institute will supply whatever funds are lacking and apply them on the foundations and the interior fittings, such as electrical wiring, plumbing, or heating as the case may be; thus leaving my subscription to cover the building first and those other items afterwards as far as the fund of three million dollars will go."

IN THE meantime the European War broke out and communications between Mr. Eastman and Dr. Maclaurin were more or less infrequent until in February, 1916, when the President penned a hastily written note to Mr. Eastman.

"I have just heard by accident that Mr. A. D. Little, '85] a member of the Corporation of this Institute, is going to Rochester today in the hope of seeing you and interesting you in a project for the strengthening of our Department of Chemistry. His cause is a most laudable one, but of course he would not venture to [illegible] you in the matter, if he had any inkling of what you had already done. I could not dissuade him from his project without revealing your identity as a benefactor. I do not feel free to do anything that would even point the way in that direction."

The President of Technology was much more worried than Mr. Eastman, who received Dr. Little and listened patiently to the fullest exposition of the plans of the Visiting Committee for the Department of Chemistry and Chemical Engineering. Although Dr. Maclaurin had forwarded Eastman also a confidential copy of the committee's recommendations, Rochester's silent citizen listened as if he were totally unacquainted with the developments along the Charles River. Mr. Eastman was interested in Dr. Little's proposals as it involved "the extension by the Institute of its facilities for industrial research."

Dr. Little could not have selected a theme that was closer to Eastman's ideal, or one that would have expanded his interest in the Institute more than that of research. Eastman listened and questioned his caller without indicating that he had ever previously given a copper to education. When he wrote Dr. Little within a few days agreeing to furnish the total sum of three hun-



Kodak Park and the huge plant of the Eastman Kodak Company, Rochester, New York

dred thousand dollars which the committee required, the head of the Little Laboratories was so overwhelmed that he wrote Mr. Eastman that he was "quite unable to express" his "deep sense of appreciation of your splendid generosity toward the Institute of Technology."

There appears to be little doubt that Dr. Maclaurin, too, was surprised, but Mr. Eastman enjoyed the game so much that he permitted the Institute to make a public announcement of his name in connection with this gift. This was a fine stroke of strategy, for no one thought that the anonymous "Mr. Smith" would make a public contribution.

The incident caused President Maclaurin to change his method of approach. At the time, he did not realize, perhaps, that Mr. Eastman never did anything impulsively, that his casual manner was only a cloak to conceal the intense study and thought which he had given to the problems and possibilities of the Institute. So, for the first time President Maclaurin wrote that he would like to discuss "the larger problems of the Institute's future policy. Your interest and readiness to help have been so remarkable that I should naturally seek to profit by your judgment and business experience in dealing with the larger problems with which we are confronted."

AFTER another long conference together, Mr. Eastman wrote Dr. Maclaurin the following:

In order to close up my previous subscription of \$3,500,000, I have requested the Bankers Trust Company to forward you a check for \$21,886.15 which with interest credited \$178,113.25 and cash \$3,300,000, previously paid, makes a total of \$3,500,000.

In order to help you carry out your program, for further equipment, increase in salaries, and so on, I make you the following proposition: If the Institute will raise \$1,500,000 additional for its endowment fund between now and the 1st of January, 1917, I will contribute a further sum of \$2,500,000, the principal of which is to be used only for extending the main educational building when and as required. The income from any unexpended balance of this sum may be used for current expenses. Payment of the amount to be made in sums of \$500,000 as fast as you complete the collections of the sum of \$300,000 on the fund of \$1,500,000 above referred to. In case the Institute is unable to raise the full sum of \$1,500,000 before the 1st of January, 1917, I shall be obligated only for a total sum in proportion of five to three upon what it has raised toward said fund of \$1,500,000.

I make the same request in regard to not disclosing the source of this offer that I made in regard to the \$3,500,000 contribution.

This was another surprise for Dr. Maclaurin which he naturally acknowledged immediately. On the 15th he described the reception of the announcement to the Alumni.

We have just completed a three-day celebration of the opening of our new buildings. I am told that between forty and fifty thousand people were present and the utmost enthusiasm prevailed. For the first three days of the week, admission was confined to invited guests, but for the rest of the week the buildings are to be open to the public. I shall have forwarded to you some newspaper accounts of the proceedings.

Since I wrote you last, a special meeting of the Corporation of the Institute has been held to accept the extremely generous offer contained in your letter of June 3d. The Corporation appointed a committee to draw up a statement expressing the thanks of the Institute for your continued liberality and its appreciation of the splendid opportunity that is thus presented to Technology to become the greatest school of applied science in the world. . . .

The public announcement of your great gift was made by me at the banquet held in Symphony Hall last evening. The banquet was in itself a notable affair, especially as we had the opportunity of speaking to 36 different groups of Alumni scattered throughout the length and breadth of the country.

The announcement of your gift was received with the greatest enthusiasm everywhere, and I think you would have been interested in hearing the cheers that were given simultaneously from the 36 cities that were on the lines (long distance telephone lines). During the evening the President of the Alumni Association, Mr. Stone (of Stone & Webster, and also President of the American International Corporation), presented a volume of original drawings representing different aspects of the new buildings and charged me with the pleasant duty of transmitting this to you with the compliments and the most hearty appreciation of the Alumni Association. I hope that I may have the pleasure of conveying this to you in person at any time that suits your convenience.

The announcement of this great gift so stirred the enthusiasm of the Alumni present that a million dollars was subscribed during the evening . . . it has made such an impression on everyone who has heard of it that the lasting benefit to the Institute must be great indeed.

Again the national guessing contest was renewed. Who was "Mr. Smith?" The clues reached many cities; but not Rochester, for, although approaching his 62d birthday, Mr. Eastman was unknown nationally as a philanthropist.

Before the time limit expired, the Institute succeeded in raising the sum and everything was quiet along the Charles and Genesee Rivers until June, 1919, when

Dr. Maclaurin came to Rochester for another secret visit. While at breakfast, he outlined his plans for raising an additional fund for the Endowment, and Mr. Eastman, as usual, was vitally interested, as indicated by his letter.

"Just to have the matter on record, I repeat my oral offer as follows: That I will give the Institute, for endowment purposes, five thousand (5,000) shares of Kodak common stock, providing the Institute will raise an additional sum of three or four million dollars. I prefer to set the sum at four million but leave that to you. The time limit is December 31, 1919. In case the Institute is not able to raise the sum I will donate a lesser number of shares, in proportion to the amount raised."

There was no stipulation this time as to secrecy but now it was in the interest of the Institute to utilize the pulling power of the mysterious "Mr. Smith."

October 15, 1919, Mr. Eastman wrote thanking Dr. Maclaurin for the airplane pictures of the Institute, received at a time when the newspapers had, for the first time, located "Mr. Smith," although neither Dr. Maclaurin nor Mr. Eastman would satisfy public curiosity.

"Enclosed is a clipping from a local paper," Mr. Eastman wrote. "I conclude that you were pestered yesterday by a flock of telegrams from this town inquiring about the Boston rumor. The only reason I ever had for withholding my name from connection with my original gifts to the Institute was to avoid the nuisance of the notoriety of big giving. My connection with several transactions lately has by force of circumstances done away with this reason and in any event the transfer of stock involved in my last offer would make my name public, so this is to let you know that you are now at liberty to make any announcement you choose in regard to my share in the whole affair. I consider that I have saved myself annoyance somewhat at your expense heretofore and it will no doubt be a relief to you to get the matter off your mind."

THE Institute launched a successful nation-wide drive to raise four million dollars to equal the approximate market value of the Kodak shares. Sunday morning, January 11, 1920, newspapers throughout the country broadcast the announcement made by General du Pont: "Mr. Smith is George Eastman."

Not even the echoes of this dramatic announcement, however, ever reached Dr. Maclaurin, for his life work reached a tragic end four days later.

"The shocking news of Dr. Maclaurin's illness and death has kept me from acknowledging your courteous letter of January 15th," Mr. Eastman wrote General du Pont. "I feel that the loss of such a man is almost irreparable, not only to Technology but to our country as well. As I have talked to him and learned of the scope of his plans and ambitions for Tech and its place in the development of this country, I can estimate in a measure the tragedy of losing him at this time. You who have been in closer relation to him are able to realize this more keenly.

"Helping to make those plans possible — which, by the way, I first learned of by studying his yearly reports — has appealed to me (*Continued on page 302*)

THE TREND OF AFFAIRS

IN THIS SECTION: *A Remarkable New Insulating Brick* (294); *Metal Veneers* (289); *Approaching the Perigee of Coldness* (290); *Statistical Abstract on Transportation* (291); *Sea Gulls as Submarine Detectors* (291); *Population Studies in Cleveland* (292); *The Roebling Family, a Book Review* (292)

Putting Guns to Work for Industry

USE of powder as power adaptable mechanically for industrial purposes was proposed by Christian Huygens as early as 1680, but not until the present decade has any progress been made toward that goal. Huygens suggested that gunpowder be utilized to obtain continuous motive power, and Papin and the Abbé Hautefeuille later endeavored to build gunpowder engines, but, of course, without a modicum of success.

Gunpowder's industrial use lies in a different direction—in pressure tools. The late Robert Temple, an Englishman, first devised and patented what he called an "explosively-actuated affixing device." His work, initiated by a desire to gain access to sunken submarines, has been carried on by his son, Robert, Jr., through the Temple Velocity Equipment Company, New York.

The Temple Velocity tools are essentially machines for mechanically harnessing the explosive energy of powder so that it may be employed for driving rivets, for forcing studs or bolts through metal, for pressure joining, and for a multiplicity of other uses. By delaying the release of energy produced by burning powder in confinement until its maximum pressure has been reached, then letting it all go at once, these Temple guns, weighing from 10 to 15 pounds, produce Gargantuan smacks. Furthermore, they operate without noise or appreciable recoil.

THE VELOCITY DRIVER, in its smaller size (weight 8 to 10 lbs.; length 13") takes $\frac{5}{16}$ " studs. The larger size (weight 15 lbs.; length 18") is designed for $\frac{1}{2}$ " studs and will drive hollow, threaded, or tapered studs or a solid pin through a steel plate $1\frac{3}{8}$ " in thickness. It will perform this feat without utilizing previously drilled holes, and the depths of penetration may be controlled.

The driver may be equipped to operate under water, and thus may be used for attaching studs to sunken ships, for fastening patching plates on ship hulls without benefit of dry docks, and for driving pipe nipples through the hulls of sunken submarines so that oxygen and liquid food might be sent to a trapped crew.

THE VELOCITY PRESS is used for pressure joining. This machine was developed at the specific request of utility companies who desired a small, efficient device which could be readily used either for low tension work in manholes or for high power lines above ground. Up to the present time, due to restrictive space, the majority of cable splices underground has been made by hand, with the natural loss of time and human element involved.

A small blank cartridge, exerting its energy upon a piston, which in turn impacts on a die, instantly will compress a connector sleeve containing an insert of wire cable. The result is a solid mass of either steel, copper, or aluminum, giving excellent conductivity. These machines are light, compact, and can readily be designed to develop tremendous energy at extremely low costs. For most cables a 22-caliber blank cartridge is sufficient for the charge.

THE VELOCITY CIRCUIT BREAKER is a protective device to be installed in Westinghouse and General Electric new work systems for underground electrical service. This is a rugged device, actuated by a small charge of powder, ignited by a fuse wire. The explosive force is in back of a ram which, in turn, is in contact with a heavy copper strip. Upon discharge, the energy developed bends back the copper strip—thus breaking the circuit. It is practically noiseless in operation, and positive in action.

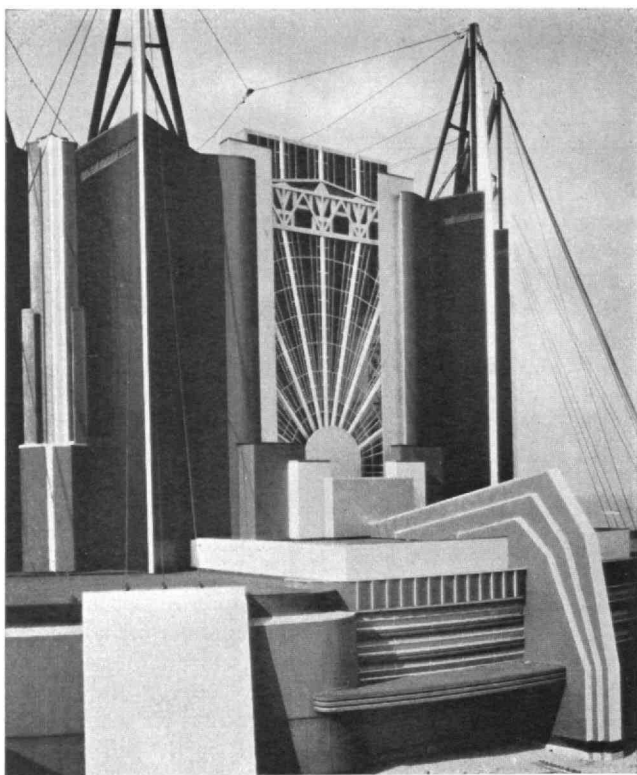
It is conceivable that the guns will be adapted to many other uses, particularly for jobs where power for air pressure or welding is unavailable. A small gun for killing beef is an interesting though seemingly far-fetched application. Where air hammers cannot be used, a single blow from one of these guns will head rivets.

Metal Veneers

THE development of veneers of metal on metal, wood, felt, asbestos, and even thin paper is opening up new fields in which beauty and utility are combined.

From an economic point of view, these combinations are of great importance. The high cost of certain metals has in the past prohibited their use for many purposes





The illustrations on this and the opposite page are of the Travel and Transport Building of Chicago's 1933 World's Fair. Above is shown one of the entrances to this unique structure, and below is a construction photograph of the dome which roofs one of the largest unobstructed areas ever enclosed by man

for which they are now employed in the form of thin corrosion-resisting veneers over a cheaper metal.

Pure nickel is being found adaptable as a veneer on steel in the chemical industry, including the lining of tank cars for the transportation of caustic soda and chemicals employed in the rayon industry. This veneer solves a vexing corrosion problem most satisfactorily.

Another veneer of rustless metal applied on ordinary open hearth steel has already been widely used in the automotive industry. It is employed for bumpers, lamps, hub caps, decorative devices, tubing, windshield stanchions, and other parts. It can be drawn, spun, and formed to any shape as readily as solid metal. The veneer can be applied on one or both sides of the metal.

The Mellon Institute of Industrial Research has just announced a new "protected" metal. This is a laminated metal-felt product in which felted materials are cemented to steel by heat and pressure. The adhesives are metal. This new protected metal is said to promise great flexibility in providing corrosion-resistance for the materials to which the metal is bonded may be chosen to meet the demands of special applications. It can also be developed as a fireproof material by bonding with asbestos and is said to afford excellent insulation.

The use of metal veneers for decorative purposes, particularly in architectural treatments, has unusual and

far-reaching possibilities. Some of these uses are clearly indicated by the materials now available. Among them are various kinds of laminated woods faced with metals. Still another is paper with a thin metallic coating laid upon it by a new method of spraying liquid metals.

The rapid development of veneered materials indicates the coming of additional achievements in a field of almost limitless possibilities.

Nadir of Coldness

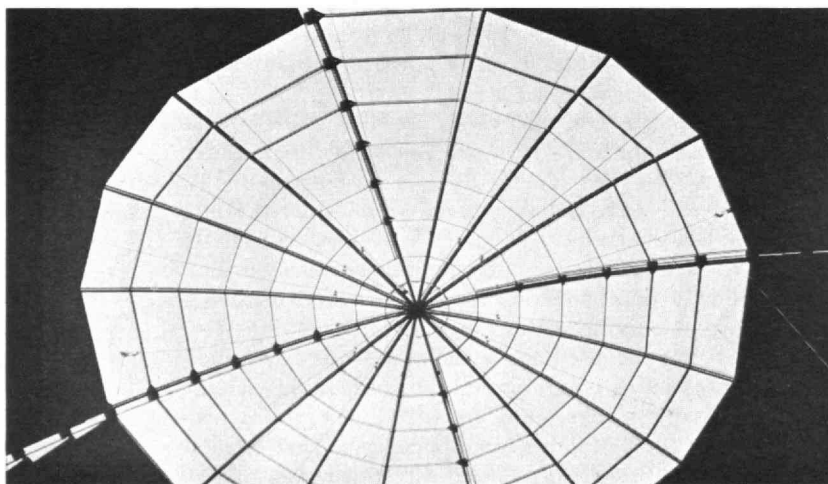
ALTHOUGH the public has heard little of cryogenic (low temperature) research, investigations in this field have developed vigorously in America within the past few years. The significance of this work lies in the fact that liquefied gases possess certain attributes that suggest that they may eventually have very practical applications in everyday life.

J. B. S. Haldane has pointed out that liquid hydrogen is, weight for weight, the most efficient known method of storing energy, because it gives three times as much heat per pound as gasoline. In time, motors may be developed to utilize liquid gases as fuel. Already rocket motors have been devised which utilize liquid oxygen mixed with gasoline.

In 1908, Professor Kammerlingh Onnes of Germany liquefied helium gas, an achievement which was later duplicated in this country by research scientists in the Bureau of Standards. Recently, Dr. W. Keesom of Leyden University, a co-worker of Onnes, succeeded in cooling a space of ten cubic centimeters to within 0.75 of a degree of absolute zero.

It was Lord Kelvin who, in 1848, announced a scale, based on fundamental laws of thermodynamics, which arbitrarily fixed absolute zero, the point of total absence of heat, at -273 degrees C. This standard is known today as the Kelvin scale, and is based upon the law of expansion of a perfect gas. Scientists say that absolute zero will never be attained. The fact that anyone has approached within 0.75 of a degree of that goal is considered a great achievement. Dr. Keesom's work was carried out with liquid helium.

Liquid gases for such experiments are extremely difficult to handle. Highly efficient vacuum flasks, some of them with double vacuum chambers, are used for the storage of these gases.



Science is much interested in the conditions which exist in a substance at absolute zero. Lord Kelvin believed that at this temperature molecular motion would stop. It is a well-known fact that extreme cold enables metals to carry many thousands of times more current than they will carry under ordinary temperatures. At Cambridge University, Dr. Peter Kabitz is working on the problem of constructing super-electromagnets. He will be able to profit much in his researches by immersing the wires in liquid helium.

Technology's plans some day to establish a cryogenic laboratory are an indication of the realization of the possibilities that lie in future knowledge of low temperatures.

Transportation Trends

DATA bureaus keep their production lines moving briskly, unaffected by economic conditions, thereby providing constantly as nearly up-to-date international statistics as possible for comparison with U. S. figures.

Examples in the railroad field:

1. *Railway mileage* (1929) — U. S. 249,433 or nearly a third of the world's 763,462. Russia is the second country with 47,869; India next with 41,724; and Canada fourth with 40,871.

2. *Passengers* (during 1929) — U. S. 786,432,000 or 7% of world's 10,574,490,000. Germany led with 1,980,300,000; Great Britain was second with 1,704,754,000; Japan was third with 1,123,578,000; and the U. S. was fourth.

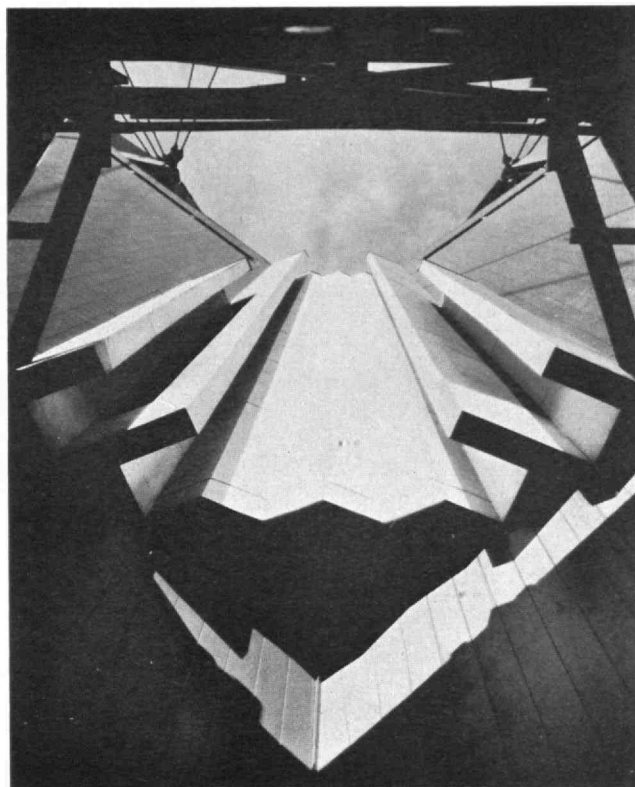
3. *Passenger revenues* (during 1929) — U. S. \$6,373,000,000 or 36½% of world's \$17,414,100,000. Russia ranked second with \$1,528,200,000, and Germany third with \$1,274,500,000.

4. *Freight in ton-miles* (during 1929) — U. S. 408,400,000 or nearly 57% of world's 718,541,000,000.

Examples in the automotive field:

1. *Highway mileage* (1930) — U. S. 3,024,233 or 38% of world's 7,959,193. Total for Europe was 2,453,160; for Asia, 1,072,408; for North and South America, exclusive of U. S., 770,873; for Australia, New Zealand, and Oceania, 380,800; for Africa, 257,668.

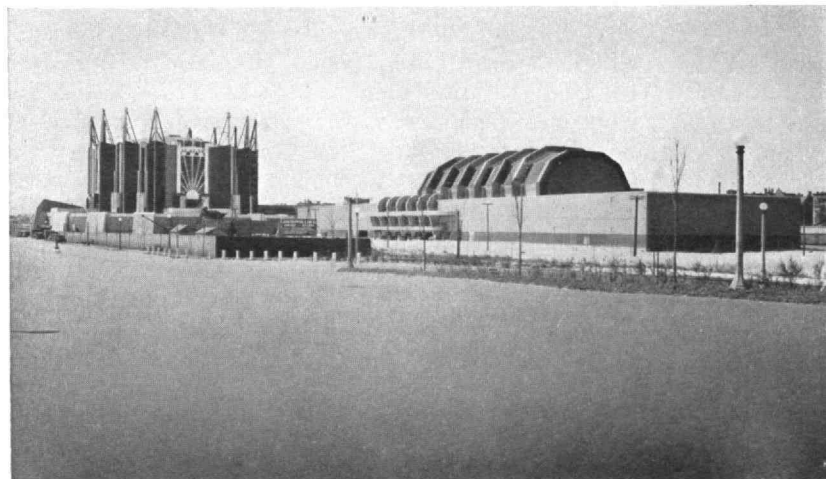
2. *Automobiles*, including passenger cars, trucks, and busses (beginning of 1932) — U. S. 24,132,116 or 67% of



Looking upward toward the steel towers from the tops of which supporting cables run to support the dome, like a suspension bridge. This building represents the first important application to architecture of the principle of suspension support. Below is shown both the domed structure and its wing, 1000' long

world's 35,441,933. Europe had 5,586,320; North and South America, exclusive of U. S., 2,013,977; Australia, New Zealand and Oceania, 772,287; Asia, 566,353; Africa, 370,880.

Unfortunately, world data on transportation by pipelines is incomplete. In this country last year, more than 15,000 miles of tubes to pipe gas, oil or gasoline were being laid down. Three-quarters of this mileage (7,700) was for gas (See The Review for February and December, 1931) while 4,200 miles were for oil and the remaining 3,400 were for gasoline. The total expenditures for these trunk-lines, with their feeders, have been estimated at \$400,000,000, "one of the bright spots in 1931 construction" in this country.



Sea Gulls and Submarines

AN attempt by British naval officials to use sea gulls to locate German U-boats in the World War was disclosed by President Karl T. Compton in a recent address before the Twentieth Century Club in Boston.

Dr. Compton described the efforts of British seamen to train sea gulls to follow the enemy undersea craft. Using their own submarines the Englishmen cruised beneath the surface of the sea, and through openings in their vessels released food attractive to gulls.

The sea gulls followed the trails of food on the surface of the water, and in theory were to have trailed German submarines operating in English waters. But all the plans went for naught, possibly because the Germans did not leave a set trail of choice bird food, or if they did, the sea gulls had no taste for it.

Among about 20 other methods used for the equivalent of seeing submerged submarines, Dr. Compton told of the use of electrically charged wire cables and of a device involving the employment of certain types of crystals and high frequency sound waves. Similar methods, he said, have been applied to peace-time purposes, including investigations to determine what is in the outer layer of the earth's surface.

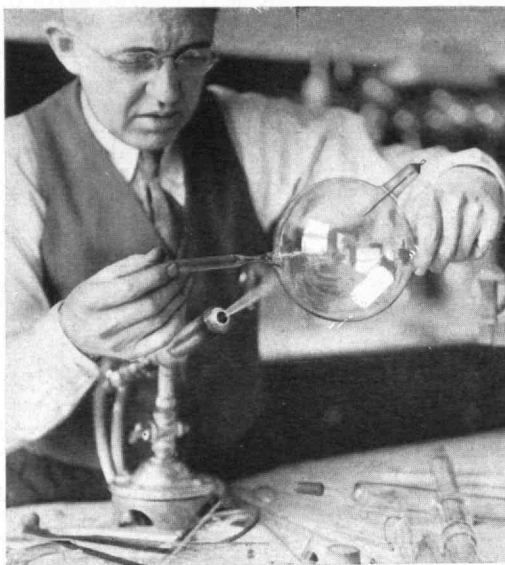
He said that two of his colleagues decided that sound waves or electric vibrations, which were used so successfully to locate hidden artillery, could also be used to determine rock formations beneath the earth's surface and to locate oil pools. Many other scientists had the same idea at about the same time, and the method is now used extensively in the oil fields.

Cleveland Investigates Itself

CLEVELAND, Ohio, is one of the most enlightened and enterprising cities in America, a fact that has been demonstrated in many ways, not the least of which is the record of achievement attributable to its Health Council. Not content to carry on work with inadequate knowledge of the conditions with which it must cope, this body has carried to completion the most elaborate and complete statistical population study ever made of a metropolitan area. As Leonard P. Ayres has written, "It is now true that Cleveland has more information concerning the composition, the distribution, and the characteristics of its population than exists in any other city in the world."

It is not surprising to discover that the man behind this achievement in fact-collecting is an engineer, and it is gratifying to observe that this engineer obtained his training in the Institute's Course in Sanitary Engineering. His name is Howard Whipple Green, '16, and he is director of the Health Council. His work is a convincing example of the contribution that the enlightened engineering mind can make to economic, social, and health progress.

The *Plain Dealer* Publishing Company has assembled the results of Mr. Green's study into a book entitled "Population Characteristics by Census Tracts, Cleveland, Ohio" (priced \$25.00). The 28 plates, 38 charts, and 69 tables presented in this book will answer every reasonable question about the distribution and



Donald C. Stockbarger, '19
*Glass blowing for science. J. E. Ryan, glass blower
of the Institute's Department of Physics*

characteristics of the population making up the five-city area included in Greater Cleveland.

Not alone to the public health officer is this book valuable. The public school authorities are finding it useful in pointing their advances against illiteracy. The city planners, the transportation companies, the social workers, the bankers, and those with things to sell all find information in it contributing to their greater efficiency.

Other cities well might pause, investigate, and take heed.

Recording the Achievements of American Engineers

THE HISTORY of Engineering in America has not yet been written, or have enough adequate

biographies of our more prominent engineers been prepared. There are, however, propitious signs in the heavens. Engineers are beginning to appear who can write and who have the wide culture necessary to present worthily the philosophy and history of engineering.

While these gifted ones gird their loins, we must be content with a few choice crumbs, such as the following book. It is reviewed gladly and in the hope that other engineers may receive their meed — preferably from the hands of their brother engineers.

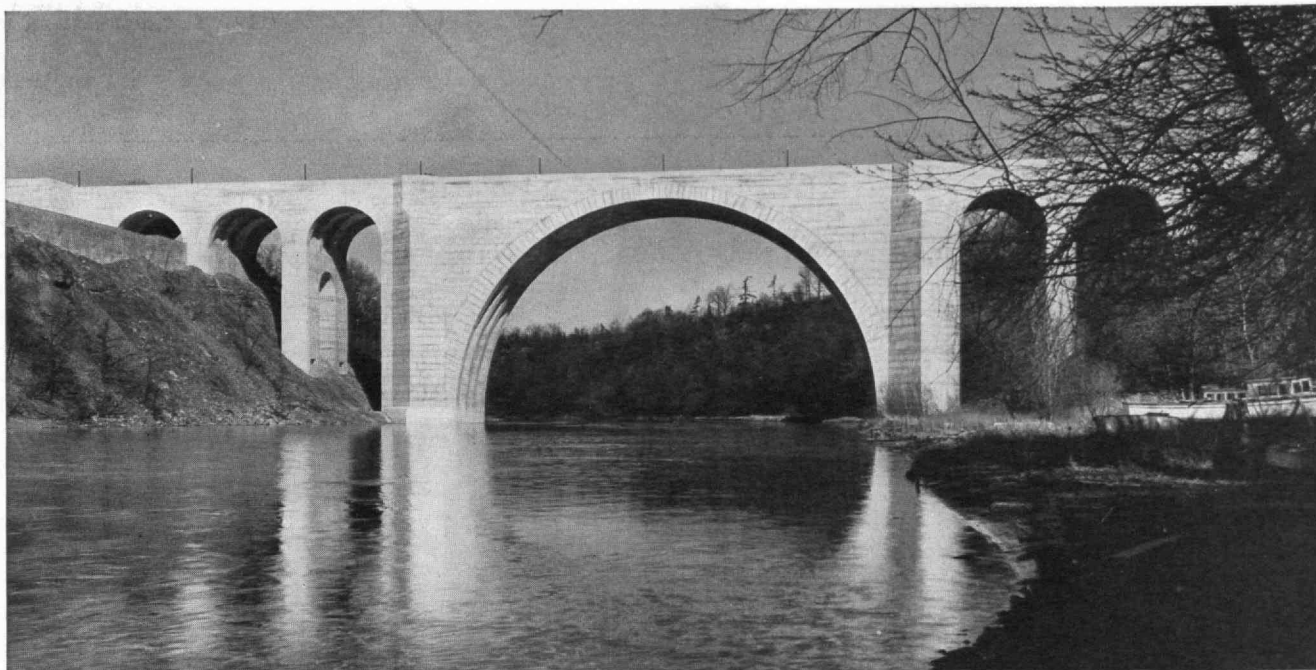
THE ROEBLINGS, by Hamilton Schuyler, \$5.00. VII+425 pages. Princeton, N. J. *Princeton University Press*.

Like other professions in America, engineering has at different periods been influenced by the methods and ideas of different European nations. In pre-Revolutionary days, such technical arts and sciences as were necessary were largely derived from England. The Revolution brought a close association with France and a consequent absorption of French ideas. Many French engineers came to America, and American engineers went to France for training and information.

This period of French influence lasted until the decade beginning about 1830 when a tidal wave of German immigrants swept over the Eastern seaboard, bringing with it many skilled mechanics and trained technicians. Albert Bernhardt in his book "The German Element in the United States," points out that "in the constructive work of our country, involving problems of magnitude never before presented, the German element may be said to have had a monopoly . . . the technical schools of Germany were very efficient and sent out well-trained men. . . ."

"The greatest advances made in the history of bridge building in the United States were produced by two Germans: John A. Roebling, the inventor of the modern suspension bridge; and Charles C. Schneider, constructor of the successful cantilever bridge."

It is of the first of these, the gifted and prodigiously industrious John A. Roebling, and of his descendants that Mr. Hamilton Schuyler has written.



Samuel H. Gottscho

William Gehron of New York was awarded the silver medal of honor in architecture by the Architectural League of New York for his design of this memorial span over the Genesee Gorge near Rochester, New York

John A. was a young man of twenty-five when he led an expedition of German colonists to a settlement near Pittsburgh. He was an accomplished youth, holding a civil engineering degree from the Polytechnic Institute at Berlin, and embracing a philosophy derived from a close association with Hegel.

First a farmer and realtor in America, he quickly found opportunities for applying his engineering training. He secured employment as a state engineer, worked on canal projects, and surveyed a railroad route over the Allegheny Mountains which later became a part of the Pennsylvania Railroad system — a project he visualized and forecast. His wire-rope factory, the first, he established at Saxonburg, Pa., in 1841 to supply cables to replace the troublesome hemp rope used on the inclined portages over the Alleghenies.

Having developed wire rope and machinery for twisting it, it was logical that he should perceive its usefulness in suspension bridges, of which there were already a number in America, notably those built of chains by James Finley, and of wire by Charles Ellet. There is a common misapprehension that Roebling was the originator of the suspension when, in reality, his contribution was to take an old design, which contemporary engineers mistrusted, and perfect it, adding elements of strength, rigidity, and longevity. Undoubtedly, he was the first to prove it a suitable type for railroad and other large bridges.

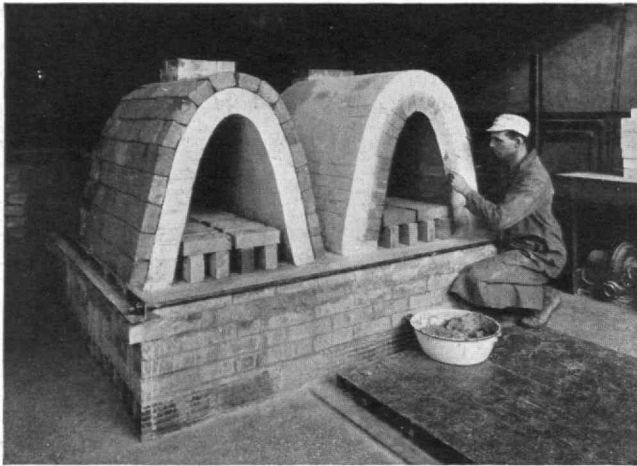
The structure that first brought him great fame and that threw the collective engineering nose temporarily out of joint was the Niagara Gorge Suspension, completed in 1854. Fifteen years later, with many majestic bridges to his credit, his life came to a sudden and tragic close, as he was starting Brooklyn Bridge, which he conceived and planned. While taking observations on the site, one of his feet was injured and tetanus set in.

But, if John A. was not to see the realization of his magnificent conception, it was no doubt comforting to him to know that he had a son who might — and did. Washington A., the eldest of four sons, had been sent to Rensselaer Polytechnic Institute, and upon finishing had assisted his father in his great bridge projects, including the planning of the Brooklyn span. It was appropriate, therefore, that he should be appointed as chief engineer to succeed his father, and so he was in 1870, at the age of 33. From then on, his story is one of heroic fortitude. His health was permanently injured by his arduous work in the great caissons sunk beneath the river for the foundations of the towers, and he was forced to supervise the major portion of the construction from his bed in Brooklyn. But with the aid of his wife and associates, he did it, and astoundingly enough lived as a semi-invalid until 1926.

In the meantime, two of his brothers, Ferdinand and Charles, were managing the Roebling business in Trenton and building it into one of America's greatest corporations. Both, like their father and elder brother, were able engineers, and Ferdinand was endowed with great talents for business and public service. And now that they are dead their sons carry on. At the present time, John A. Roebling's living descendants total twenty-three.

Mr. Schuyler's story, then, is the saga of a mighty American family. In its high transmitting of ability from one generation to another, it equals in the field of engineering the Stevenson family in England, the Baldwin family in New England, and old James Stevens of Hoboken and his gifted progeny.

The book is somewhat scrap-bookish, although it never ceases to be interesting, and the suspicion that it is a subsidized job is of minor importance. The proof reading of the book was capriciously done. J. R. K., JR.



Two kilns: the left, lined with insulating refractory; the right, with a firebrick. The insulating brick kiln can be heated up to 2,700° F. in 50 minutes, while the kiln on the right requires five hours at the same gas rate

New Insulating Firebrick

Written by FREDERICK H. NORTON, '18

FOR many years there has been a demand for a refractory having a resistance to heat of the same order as that presented by a high grade fireclay brick, while at the same time having a degree of insulating power which would compare favorably with the better types of insulation. The brick should not only have a high fusion point, but it should be resistant to rapid temperature changes, and should show no appreciable shrinkage at service temperatures which may go as high as 2,600° F.

The problem of developing such a brick has been carried on at the Institute for a number of years, and a product which showed very interesting possibilities was produced in small quantities. The material used for the brick was Georgia kaolin which is a very pure form of white clay. This clay has the high fusion point of 3,200° F. A great many difficulties had to be overcome in the development of this product since the kaolin has a very high shrinkage in firing, and must, therefore, be burned to a temperature at least as high as the temperature that it will receive in use. Within the last year this brick has been placed in commercial production and most of the manufacturing problems have been solved.

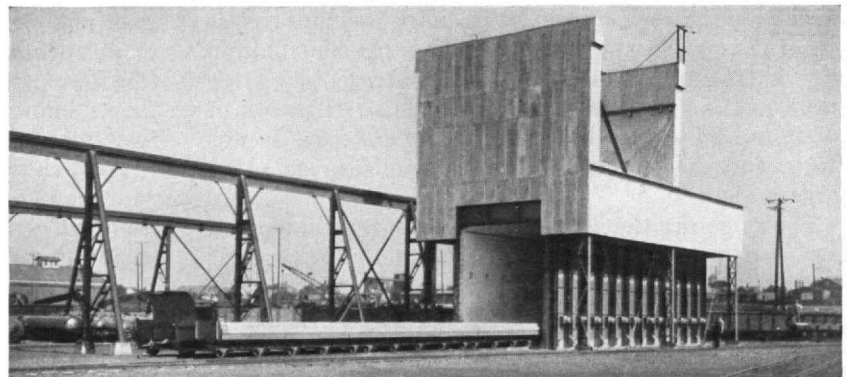
The brick has a weight of about 1.7 pounds as compared with 8 pounds for a firebrick. Its thermal conductivity at 2,000° F. is 3 as compared with 15 for the firebrick. It will support a load of 6 pounds per square inch up to temperatures of 2,600° F. One of the greatest advantages of this brick is that it can be sawed and filed into any shape with great ease, which makes it possible to form intricate shapes for special furnace parts with very little expense. Due to the extremely porous nature of the material of which the brick is made, it is rather permeable to gases, and usually the inside surface of the brick lining is

coated with a thin layer of cement which seals the surface pores.

This brick is particularly valuable in intermittent furnaces which must be heated and cooled rapidly. Due to its very low weight, it has been found that only 10 to 20% of the fuel required to heat up the usual firebrick furnace is needed. It is also possible to reduce the heating-up time by about the same amount which is a great advantage in furnaces that must be heated up every morning. The fuel required to hold a furnace at a given temperature is also much reduced by using this brick, as a 9-inch wall of the insulating refractory is a considerably better insulator than a 36-inch wall of fireclay brick. Another advantage of the thin walls is the fact that the outside dimensions of the furnace can be considerably reduced. Also the good insulating properties and the low mass permit a much more even temperature in the furnace than if it were lined with fireclay brick. This is very important since evenness of temperature in a furnace is often very difficult to achieve.

Above there are shown two laboratory kilns under construction. The one at the left is lined with insulating refractory, and the one on the right with a firebrick. The two kilns are identical in size, and careful comparative tests have been made on them in the Heat Measurements Laboratory. The insulating brick kiln can be heated up to 2,700° F. in 50 minutes, while the other kiln requires five hours at the same gas rate. The insulating brick kiln, therefore, requires less than one-fifth the gas to bring it up to temperature. The insulating brick kiln has a very even temperature distribution even at the start, whereas the firebrick kiln does not become even in temperature until the temperature has been balanced for some time.

Below is shown a photograph of one of the largest annealing furnaces in the world which is at the Barberton Works of the Babcock and Wilcox Company. This furnace is 60 feet long, 15 feet wide, and 22 feet high, and is completely lined with 9 inches of insulating firebrick, held on the inside of a steel casing with a few lag screws which are screwed into some of the bricks for anchors. This furnace can be heated up with the drum in place to 1,200° F. for strain annealing, in the remarkably short time of 40 minutes. The kiln is fired with natural gas and about 1,000 cubic feet are required for strain relieving one ton of steel. This shows great economy over firebrick furnaces.



One of the largest annealing furnaces in the world which is at the Barberton Works at the Babcock and Wilcox Company

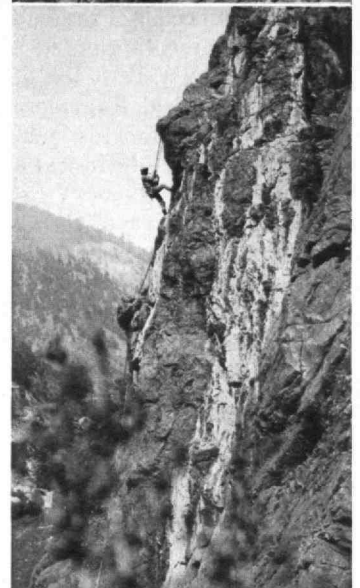
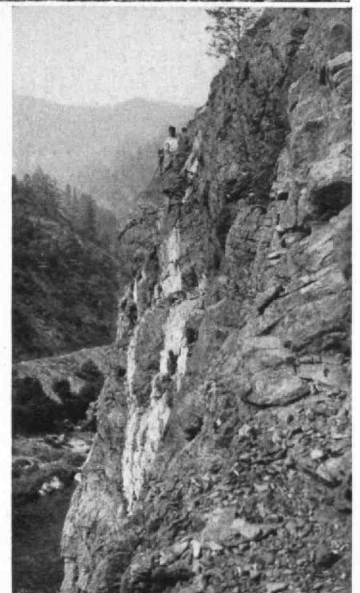


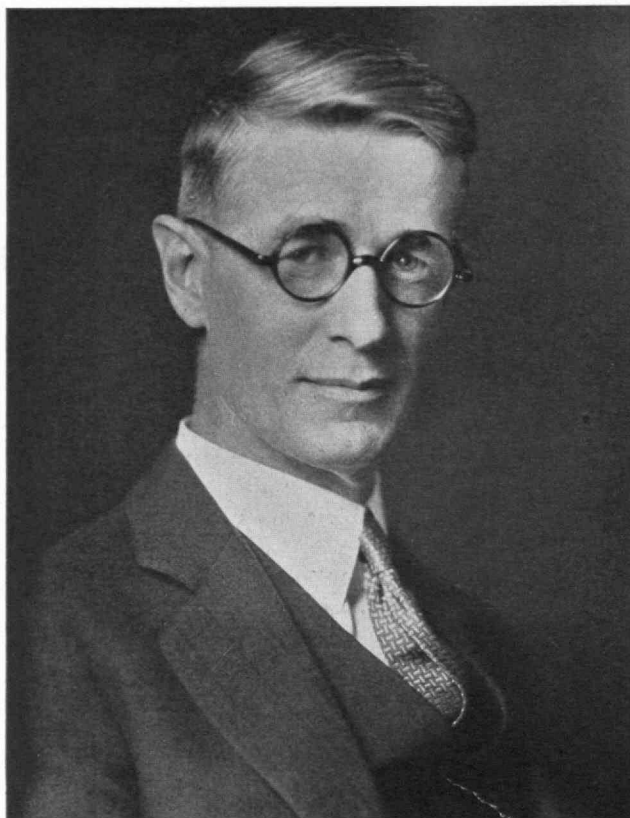
Feather River Twice Spanned

The steel arch highway bridge built by the California Highway Commission over the Feather River near Pulga, in Plumas County (State Route No. 21, extending from Oroville to Quincy).

The bridge spans a railroad which passes on a bridge beneath it. The deck of the highway bridge is about 200 feet above the river and 170 feet higher than the railway tracks, which are crossed at right angles. The main arch is a 350-foot span, and the total length of the bridge is 680 feet.

That the construction was accomplished in the face of hazards and unusual difficulties is evinced by the survey pictures on the right. By ropes the surveyors descended the face of the cliffs to set stakes for the abutments.





VANNEVAR BUSH
Vice-President, M. I. T.
Dean of Engineering

Dr. Bush, a native of Everett, Mass., is the son of the late Rev. R. Perry Bush, for 50 years a clergyman in the vicinity of Boston. He was graduated from Tufts College in 1913, and in 1916 he was awarded the degree of Doctor of Engineering jointly by Harvard University and Technology.

Early in his career, Dr. Bush held a position in the test department of the General Electric Company, and then returned to Tufts College as an instructor in mathematics. Subsequently he was promoted to the grade of Assistant Professor of Electrical Engineering at Tufts, and in 1923 he joined the Faculty of the Institute.

In 1917-18, he carried on important research in submarine detection for the special board on submarine devices of the United States Navy. He now holds the commission of Lieutenant Commander in the U. S. Naval Reserve Forces. Following the World War, he was consulting engineer for the American Radio and Research Corporation. He is a director of the Spencer Thermostat Company and of Raytheon, Inc.

As Professor of Electric Power Transmission at M. I. T., he has been particularly interested in the design of scientific calculating instruments. For the development of the product integrator he was awarded the Levy Medal of the Franklin Institute in 1928. Recently he has won wide recognition for his design of an intricate calculating machine called the differential analyzer, which greatly increases the accuracy and speed of engineering calculations. (See The Review for January, 1932.) He is also known for his contributions to the development of vacuum tubes, for his investigations in electric power transmissions, and for his conception and development of the network analyzer. Dr. Bush has also carried on important studies of transients in machines and dielectric phenomena.

Dr. Bush is a Fellow of the American Institute of Electrical Engineers, the American Academy of Arts and Sciences, and the American Physical Society. He is a member of the Society for the Promotion of Engineering Education, and of Alpha Tau Omega, Tau Beta Pi, Kappa Eta Kappa, and Phi Beta Kappa fraternities.

Besides numerous papers in periodicals, he is author of "Operational Circuit Analysis," and joint author with Professor W. H. Timbie of "Principles of Electrical Engineering." He is an enthusiastic yachtsman and during the summer makes along shore cruises on his yacht, the Caribou.

The New Administrative Organization at M. I. T.

APPPOINTMENT of Dr. Vannevar Bush, Eng.D., '16, as Vice-President of the M. I. T. was announced by President Karl T. Compton following the regular meeting of the Corporation of the Institute on March 9. Dr. Bush has been a member of the Faculty of the Electrical Engineering Department since 1923, and is noted for his achievements in research and contributions to technical education (see above). With his appointment as Vice-President, Dr. Bush also became a member of the Corporation.

In announcing Dr. Bush's elevation to the position of second in command at the Institute, President Compton revealed plans for the subdivision of Technology into the School of Science, the School of Engineering, the School of Architecture, the Division of Humanities, and the Division of Industrial Coöperation. He announced the selection of Dr. Samuel C. Prescott, '94, Head of the Department of Biology and Public Health, as Dean of Science; and Professor William Emerson, Head of the Department of Architecture, as Dean of Architecture. In addition to his duties as Vice-President, Dr. Bush will be Dean of Engineering.

Another important feature of the new academic organization is explicit recognition of the Graduate School, under which all advanced work at the Institute will be administered.

President Compton has described the new plan as follows:

"The new plan of administrative organization of the Institute adopted by the Corporation is a natural extension of the administrative plan begun two years ago with the appointment of a Chairman of the Corporation as well as a President of the Institute.

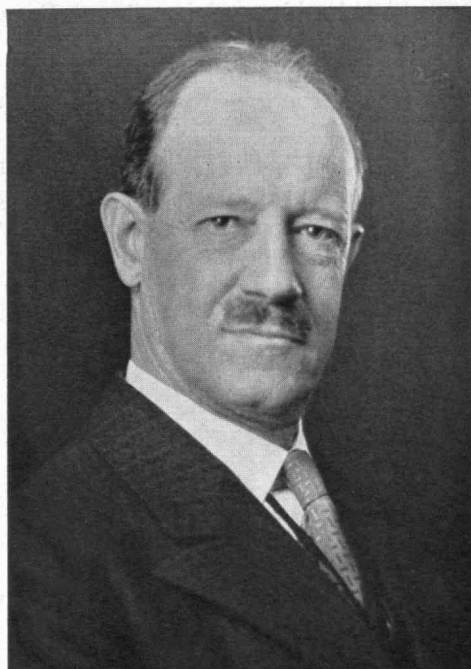
"The subdivision of the Institute, for administrative purposes, into the School of Engineering, the School of Science, the School of Architecture, the Division of Humanities, and the Division of Industrial Coöperation, recognizes the five major aspects of its work. The three schools comprise those departments of study in which degrees are given, whereas the two divisions are essentially 'service' divisions. That of the Humanities is designed to give to our students that further cultural training and background which we deem an essential part of a well-balanced training. The Division of

Industrial Coöperation is designed to make as effective as possible the assistance which the Institute renders to business and industry in solving their technical problems. While the outstanding position of M. I. T. in the field of engineering education is generally recognized, its equally strong position in science and architecture is probably not so widely known, since these activities are not explicitly indicated in the name of the Institute.

"An important feature of this new organization is the explicit recognition of the Graduate School. The Institute has awarded approximately one-third of all the

advanced degrees in engineering given in this country, and in certain departments, notably chemical engineering, electrical engineering, and aeronautical engineering, has awarded approximately one-half of all the advanced degrees. With every indication that this feature of our work is becoming relatively more important, it has seemed advisable to provide adequately for its recognition and its constructive administration.

"Although thus divided into these schools for the purpose of administration responsibility, the Faculty as a whole will continue to be the final authority.



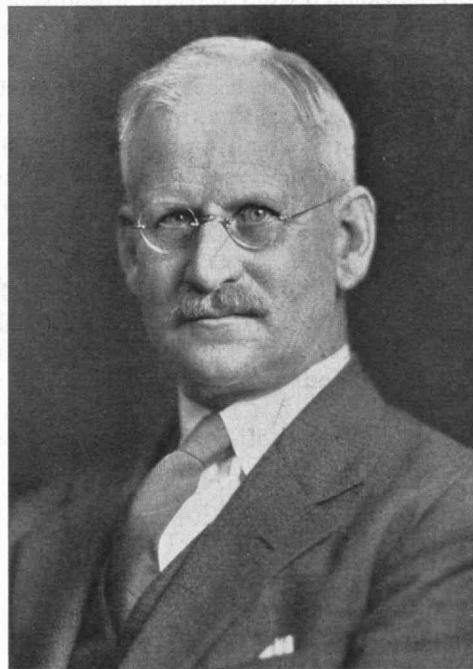
WILLIAM EMERSON
Dean of Architecture

Professor William Emerson came to M. I. T. in 1919 as Head of the Department of Architecture, following a distinguished architectural career in New York. In his professional work in New York from 1901 to 1918, he specialized in the design of bank buildings and model tenements. He is widely known for his contributions to architectural education as chairman of the educational committee of the American Institute of Architects.

Professor Emerson is a native of New York City, and was graduated from Harvard University in 1895. He then studied at Columbia University for two years, and from 1897 to 1901 attended L'École des Beaux Arts in Paris.

He served as Major and Director of the American Red Cross Bureau of Construction in Paris from 1917 to 1919, and he is a Chevalier of the French Legion of Honor. As a Fellow of the American Institute of Architects, he has been very active in the affairs of that organization, being a former first Vice-President, and a former President of the New York chapter. He is also a member and Past Vice-President of the Society of Beaux Arts Architects; a member of the Boston Society of Architects, and of Delta Kappa Epsilon; and an Honorary Member of the Alumni Association of M. I. T.

In 1928 he was elected an honorary member of the Harvard chapter of Phi Beta Kappa. Professor Emerson has been advisory architect for Radcliffe College since 1929, and a member of the A. I. A. Committee on the Pan-American Congress of Architects. In 1924 he represented the United States at the International Congress on Architectural Education Meeting in London. He was chairman of the Committee on Foreign Relations of the American Institute of Architects in 1926, which made plans for the restoration of the Church of Santa Sophia in Constantinople. He is the author of "Old Bridges of France."



SAMUEL CATE PRESCOTT
Dean of Science

Dr. Samuel Cate Prescott, '94, Head of the Department of Biology and Public Health at M. I. T., is internationally known for his work in the application of biology to industry. He was Director for many years of the Boston Bio-chemical Laboratory, and for three years directed a laboratory in Costa Rica in which were carried out important studies on soils and diseases of tropical fruits for the United Fruit Company.

Dr. Prescott was born in South Hampton, N. H., of old New England stock. He began his teaching career at Technology in 1895 and in 1900, he spent several months in postgraduate work in Berlin and Copenhagen. He returned to Technology and was made Assistant Professor in 1903, Associate Professor in 1909, and was promoted to the rank of Professor in 1914. When Professor Sedgwick died in 1921, Dr. Prescott was made Acting Head of the Department, and he was appointed as permanent Head in 1922.

During the war, Dr. Prescott served in the U. S. Sanitary Corps with the rank of Major, in charge of food research and the problems of storage at the great army training camps. This work included the development and specifications for dehydrated foods sent to troops abroad. As an outgrowth of this work, in 1918-19 he was also chief of the division of dehydration of the Bureau of Chemistry in Washington. He now holds the rank of Colonel in the Officers Reserve Corps.

Dr. Prescott is a Fellow of the American Association for the Advancement of Science and of the American Academy of Arts and Sciences. He is a member of the American Chemical Society, the American Society of Naturalists, the Society of Chemical Industry, and the American Public Health Association. He is a member and Past President of the Society of American Bacteriologists and of the Technology Alumni Association. He is a member of the Lambda Chi Alpha Fraternity.

"Because of their high standing in their professions, their thorough knowledge of the affairs of the Institute and their personal qualifications, I believe that the addition of Deans Bush, Prescott, and Emerson to the administrative staff will result in a marked increase in the amount and quality of the service which this Institute can render through its work in education and in the advancement of knowledge."

The new organization provides for an Administrative Council, an informal organization which will hold weekly meetings in order that all its members may be kept fully informed of progress in various departments of the Institute. This Council will consist of President Compton; Vice-President Bush, members of the Executive Committee of the Corporation; Dean of Science Prescott; Dean of Architecture Emerson; the President of the Alumni Association; Chairman of the Faculty Frederick S. Woods; Bursar Horace S. Ford; Professor Charles L. Norton, '93, Director of the Division of Industrial Cooperation; Dean of Graduate Students H. Manley Goodwin, '90; and Dean of Students Harold E. Lobdell, '17.

The School of Science includes Biology and Public Health, Chemistry, Geology, General Science, Mathematics, and Physics. Architecture and Architectural Engineering will be administered under the School of Architecture.

Included in the School of Engineering will be Aeronautical Engineering; Building Engineering and Construction; Business and Engineering Administration; Civil and Sanitary Engineering; Chemical Engineering; Electrical Engineering; Electro-chemical Engineering; Fuel and Gas Engineering; General Engineering; Mechanical Engineering; Mining and Metallurgical Engineering; and Naval Architecture and Marine Engineering; and Naval Construction.

The Division of Humanities will include Economics, English and History, General Studies, Hygiene, Modern Languages, and Military Science.

INSTITUTE GAZETTE

Dr. Tryon's Second Middle Western Tour

BEFORE completing his school and college visiting for the present academic year, Professor James L. Tryon, Director of Admissions, will make a four weeks' tour among educational institutions of the Middle West from which the Institute receives students for graduate work or by transfer after attending another college.

He will go as far as Denver which, owing to pressure of unexpected engagements, he was unable to include in his recent journey to the Pacific Coast. Dr. Tryon will attend the College Board meeting in New York and start westward after visiting in New Jersey and Pennsylvania.

For the vocational guidance of high school students who are trying to decide upon an occupation, he will, as usual, take as his topic "The Education of an Engi-

neer," tell boys of high school age about the kind of studies that are pursued in an engineering school, and describe the careers that are open to graduates in science and engineering.

Dr. Tryon's itinerary follows:

NEW YORK

April 6—New York City—College Board Meeting

NEW JERSEY

April 7—Hoboken—Stevens Institute of Technology

PENNSYLVANIA

April 8—Haverford—Haverford College

April 8—Philadelphia—University of Pennsylvania

April 9—Gettysburg—Gettysburg College

April 11—Mercersburg—Mercersburg Academy

OHIO

April 13—Wooster—The College of Wooster

April 14—New Concord—Muskingum College

April 15—Columbus—Ohio State University

April 16—Yellow Springs—Antioch College

April 18—Cincinnati—University of Cincinnati

April 18—Cincinnati—The Technology Club of Cincinnati

INDIANA

April 19—Lafayette—Purdue University

April 20—Lafayette—Purdue University

ILLINOIS

April 21—Chicago—Convention of Registrars

April 22—Chicago—University of Chicago

MISSOURI

April 25—Kansas City—Kansas City Junior Colleges (Missouri and Kansas)

April 26—Kansas City—Southwestern Association of M. I. T.

KANSAS

April 26—Lawrence—University of Kansas

COLORADO

April 27—Denver—Schools and Colleges

April 28—Denver—Schools and Colleges

April 29—Denver—Schools and Colleges

Date to be set—Denver—Rocky Mountain Technology Club

WYOMING

May 2—Laramie—University of Wyoming



Baron Takuma Dan, '78, and R. H. Richards, '68, in Tokio at the World's Engineering Congress three years ago. Baron Dan, Head of the House of Mitsui, was recently assassinated

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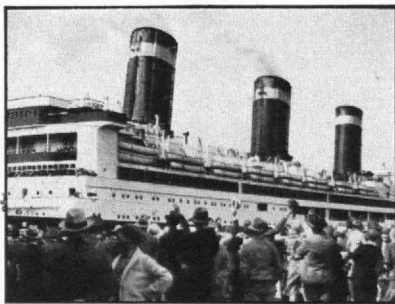
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THE MASTER KEY OF SCIENCE

(Continued from page 281)

interpreted as a result of the spin of the electron — thus increasing the “astronomical” resemblance of the atom-model; while the appearance of numerous terms in the more complex spectra was accounted for by differently quantized inclinations of the electron orbits. The complex multiplets of lines found in the spectra were thus fully explained. In its final form (due to Hund) this theory has been brilliantly successful in elucidating the structure of atoms and interpreting and even predicting the details of their spectra. Work in this field has been very active, and only the most complex spectra (rare earths and some heavy metals) and those of a few very rare elements, remain to be deciphered.

In the case of molecules, changes in the states of oscillation and rotation of the nuclei, as well as in the electronic states, are possible, and the spectra are much more intricate, consisting of complex bands comprised of closely packed lines. Those of diatomic molecules are now well understood — with important gains in our knowledge of molecular structure and the nature of chemical “affinity,” and the still more intricate polyatomic molecules show signs of yielding. Different isotopes of the same element, when present in compounds, often give widely separated bands. From these new isotopes of oxygen, nitrogen and carbon have been discovered, and the ratio of the masses of the different atoms determined with extreme precision. In atomic

spectra, the isotope effect is extremely small, except for hydrogen — where it has recently permitted the identification of an isotope of double weight.

Fine-structure in the lines of heavier atoms arises partly from the presence of isotopes, partly from some sort of “spin” within the atomic nucleus, and its study affords a promising approach to the problem of nuclear structure.

While all this was going on, x-rays were also found to contain monochromatic radiations, observable by using the atoms in a crystal as a diffraction grating. These spectra have given us information about the interior of atoms, comparable with that which optical spectra furnish concerning the exterior. They are much simpler than the latter, and now furnish the chemist with his most delicate test for the detection of new elements. Incidentally, they make it certain that except for the few well-recognized gaps, no elements lighter than uranium remain to be discovered.

Working in the opposite direction, x-ray spectroscopy opens the door to another untrodden realm — the exact study of the arrangement of atoms in crystals, which can now be specified in minute detail.

All through these triumphs ran a discordant note. Certain numerical relations — notably in the Zeeman effect — though exact, differed systematically from those predicted by the orbit theory, and every calculation based on the relative positions of electrons in these orbits led to a wrong answer. This discrepancy has vanished since the orbital picture of the atom was replaced by the difficultly visualizable wave-mechanics

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or the wholly unpicturable matrix-theory. When a modern lecturer tries to draw an atom on the blackboard, he uses not chalk, but an eraser, and constructs a smudge illustrating the relative probability of finding a unit-charge in different regions. But as a means of calculation, — interpreting and, on occasion, predicting, the results of precise observation, the new theory advances from conquest to conquest.

The ramifications of these new ideas throughout the range of molecular and atomic physics are too numerous to mention. To take but one instance at random, the magnetic susceptibilities of solutions of salts of the rare earths may be fully explained by the theory of spectral structure — even though the spectra of the trebly ionized atoms (upon which these depend) have not yet been observed.

There is probably no field in which the new spectroscopy has been of more aid than in astrophysics. The recognition that Lockyer's enhanced lines are produced by ionized atoms, and the general application of the laws of ionization to stellar atmospheres have transformed our whole viewpoint. We know now that the disappearance of the lines of the metals from the hot stars means only that they have been so highly ionized that they no longer give lines in the observable region, and that the lines of the permanent gases, and the non-metals, generally are weak or absent in the cooler stars because their atoms are not highly enough excited to be able to absorb the observable lines. From measures of line-width, and also by study of multiplets, the actual number of atoms which produce a given spectral line may be estimated, and an approximate quantitative analysis made of the atmospheres of the sun and stars. The results indicate a remarkable similarity of composition, despite the great differences in the spectra of hot and cool stars. The relative abundance of the elements is similar to that in the earth's crust or in meteorites, with one noteworthy exception. Hydrogen — a minor constituent here — is overwhelmingly predominant in the stars. (The excess very likely escaped during the formation of our planet.) Both the temperature and pressure of a star's atmosphere may be found from the intensities of the spectral lines. The former agree with the values deduced from the colors of star-light; the latter are surprisingly small, and indicate that the atmospheres are of exceedingly low density. The whole atmosphere of the sun, brought to standard temperature and pressure, would make a layer of gas less than a hundred feet thick, of which the metallic vapors form about one per cent.

A similar conclusion was reached more than forty years ago by Lockyer, by the simple process of comparing the sodium lines in the solar spectrum with those absorbed by the vapor present in a Bunsen flame. The sun's atmosphere, of course, is not sharply bounded at the bottom; it grows hazier owing to the increasing density of the free electrons and ions, and passes into the luminous photosphere. The principles upon which this increasing opacity can be calculated are essentially spectroscopic, and the data regarding the ionization and excitation potentials of atoms, which it requires, have been derived spectroscopically. (*Concluded on page 302*)

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THE MASTER KEY OF SCIENCE

(Concluded from page 301)

Two more applications may be mentioned — to matter in extreme states of condensation and rarefaction.

From the spectroscopic data regarding atoms it follows that, at very high temperatures, inside the stars, they will be completely ionized down to bare nuclei and electrons. Matter in this state should be exceedingly compressible, but not infinitely so, — the limiting factor being the degeneracy of the gas (in the sense of the new quantum theory) at a density several hundred thousand times that of water. The problematical white dwarf stars, like the companion of Sirius, show conclusive evidence of being in this state, while the shift towards the red of the lines in their spectra (coming from the outer atmosphere) affords an important confirmation of general relativity. At the other extreme, the gaseous nebulae — which from gravitational considerations must be of extreme tenuity — show spectral lines which were long a tantalizing problem. Modern spectroscopy revealed the existence of metastable atomic states, from which light-producing transitions would not occur unless the individual atoms were left undisturbed much longer than they would be except in an exceedingly rarified gas. Bowen thus identified the nebular lines as "forbidden" lines of the sort produced by the most familiar elements, oxygen and nitrogen above all. The hypothetical unknown element nebulium thus very literally vanished into thin air.

GEORGE EASTMAN

(Continued from page 288)

as an opportunity to get considerable sums of money into effective action for the benefit of the whole country better than any other way."

"Of all the honors he received," Welles Bosworth, '89, architect of the new buildings wrote Mr. Eastman, "It was you who did him the greatest honor, in your generous confidence in him, and how beautifully your judgment was justified by his accomplishments. It seems inevitable that the great work that he has so substantially developed must go forward."

For more than a quarter of a century, Mr. Eastman had contended that "this country cannot progress industrially without plenty of highly trained technical men." Massachusetts Institute of Technology was the embodiment of this educational ideal, for here the

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interests of education and industry were welded by Dr. Maclaurin and "Mr. Smith."

Among the many letters which Mr. Eastman received was the following from President Lowell (dated Feb. 3, 1920), which, with characteristic modesty, was not shown to anyone.

Bishop Lawrence has shown me your letter to him in reply to his, which emboldens me to add my word of congratulation to you for your great gift to the Institute of Technology. I have been a trustee of the Institute for over 30 years; and labored hard to bring it and the Harvard Engineering School together; but unfortunately the difficulties were too great to be overcome.

The Institute has done and, with your assistance, is doing and will do a very great work. I have seen it built up from a small beginning, for my interest in it is hereditary, my father and grandfather having been among its trustees; and, indeed, one of the courts in the new building is named after my father. I suppose few institutions in the world have contributed more to advance industry and the practical arts; and I do not know that any man in the world has done so much to help an institution of engineering as you have done for this.

At the time Mr. Eastman's biography was being written he did not know how much money he had actually given Technology. When a tabulation was finally obtained, indicating an amount of approximately twenty million, he studied the figures for several moments, and then remarked: "In a few years that will not be very large, for Technology will grow."

HOW EDUCATIONAL DEFECTS LIMIT THE ENGINEER

(Continued from page 283)

America, to be preferable, but at the present time Germany is still far from such a move.

Studies at the *Technische Hochschule* take at least four or five years. At present we are in the midst of a reform movement to improve the *Hochschule* curriculum and rearrange the time schedule.

The engineer, graduating from the *Hochschule* in favorable circumstances, has attained the age of 24 or 25 years before entering practice, where, for the first time, he is to make actual use of his professional training. It does not seem to me an ideal situation that the young man of today must reach such an age before he begins to earn his living. I believe that in the near future we must, without lowering the present educational standards, find a way to permit an earlier entrance into practical life. But here again one must face the fact, already encountered in the question of preparatory schools, that the growing demands for a broader and more comprehensive scientific training of the engineer must always be taken into account.

Since the specialized training at the *Hochschule* makes heavy claims upon the prospective engineer's capacity for study, it is obvious that under present circumstances only a small percentage of the students find the opportunity to concern themselves with those subjects, however necessary, which lie outside their own special field. On that ground, only a few of them are able to compete successfully with the lawyers, business men, and business men trained in (Concluded on page 304)



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HOW EDUCATIONAL DEFECTS LIMIT THE ENGINEER

(Concluded from page 303)

law in their command of present-day affairs. Whence it comes that the number of leading positions in general life held by engineers is very small.

While in Italy, in France, and in the United States as well, it is by no means seldom that the engineer gets a leading position with the government or in a big industrial concern, in Germany such a situation is rarely found. The cause for this deplorable fact lies chiefly in the training preparatory to graduation at the *Hochschule*, and therefore a modification of this training is highly desirable.

THE EVOLUTION OF THE TECHNICAL UNIVERSITY

(Continued from page 282)

generations already in leading positions, and therefore in closer relationship with the responsible directors.

The *Technischen Hochschulen* have come to recognize in recent years that in order to obtain for their engineers in public life and private affairs a footing fully equivalent to that of graduates in law, they must give them, outside of their purely technical knowledge, a general education beyond that of preparatory schools.

To this end they have greatly expanded their curriculum, added to their faculties professors in other than technical fields, and established examinations in economics and administrative technique to which their engineers must submit.

A definite standard was evolved for the successful completion of all technical courses in the *Technischen Hochschulen* through the examination leading to the degree of *Diplom-Ingenieur*. For those engineers especially talented and capable of independent scientific work, the degree of *Doktor-Ingenieur* was created, thus establishing requirements at least equivalent and often superior to the doctorate examinations of the universities.

The reluctance of the best families to send their sons to a *Technische Hochschule* instead of a University has steadily diminished in the past decades, especially since the World War. Through an increasing enrollment of students from the higher industrial and administrative circles, the reputation of the *Technischen Hochschulen* has constantly improved.

In this way it has become possible, through improvement and broadening of the curricula and the consequent growing respect for the work of the engineers in all fields, to bring about the gradual disappearance of the prejudice against engineering in favor of law. If such a prejudice still exists in certain classes, it may, nevertheless, be asserted that the former decided supremacy of attorneys in technical undertakings and administration has already been broken.

Above all, the positions of leadership in private undertakings are in the hands of the engineers, and men like Vögler, C. F. von Siemens, Dorpmüller, and others command the greatest German economic organizations, including the *Deutsche Reichsbahn* (German railroad), the greatest nationalized traffic undertaking in the world.

(Concluded on page 306)

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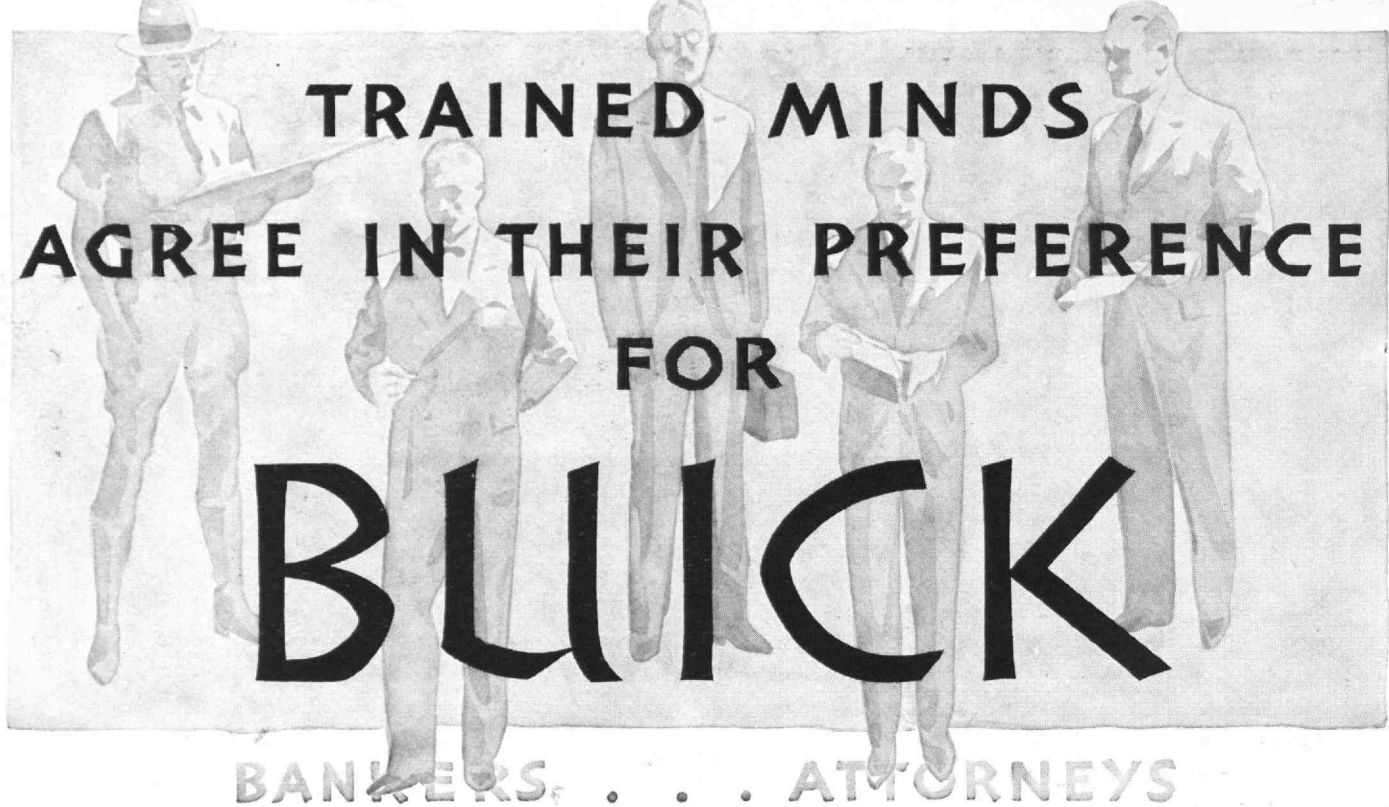


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THE EVOLUTION OF THE TECHNICAL UNIVERSITY

(Concluded from page 304)

In the government of the country it has been more difficult for the engineers to make similar progress. It is an exceptional case when ministerial posts are filled by engineers, as was the situation in Baden when the engineer Honsell, former President of the Department of Water and Highway Development, directed the Ministry of Finance of this country with great success.

At the head of the municipal government as well, one usually finds a lawyer as *Oberbürgermeister*, although the largest municipal enterprises are nearly always of a purely technical nature. But even this monopoly has already been broken several times, and it can no longer be said that the highest city positions are closed to the engineer.

To a certain extent, however, the same may be said of German engineers as is often heard in America — the reproach that they are too narrowly interested in purely technical matters, and that the general questions of political and economic life and of social welfare receive too little of their attention. This is, however, a result of that peculiarity of a technical profession which demands and imprisons the entire energy of an engineer and often makes a one-sided specialist of even the most talented. But besides these "only-engineers" there are others in Germany who are not prevented by special technical interests from obtaining a full understanding of the general questions of public life and who therefore rise to distinguished leadership in the prominent administrative enterprises.

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M. I. T. NEWS BULLETIN

PREPARED BY JOHN J. ROWLANDS, DIRECTOR, INSTITUTE NEWS SERVICE

New Knowledge on Fogs

The individual minute droplets of which fog is composed have been measured and photographed for what is believed to be the first time at the Institute's research station on the estate of Colonel E. H. R. Green at Round Hill, Mass., it was announced recently by Professor Edward L. Bowles '22, Director of the station.

The studies of fogs, which have resulted in the successful measurement of individual particles, were undertaken as an approach to a more complete understanding of this phenomenon of nature, the worst enemy of the navigator in the air and on the sea.

The individual particles of fog are found to range in size from two twenty-five hundredths to one twenty-five thousandths of an inch in diameter. The smallest of these are only slightly greater in diameter than the wave length of red light. In technical terms, the dimensions range from one to 20 microns. The size of the smallest of these particles is indicated by the fact that 25,000 of the droplets could be placed end to end within the space of one inch.

The measurements and photographs of fog particles were made by Henry G. Houghton, Jr. '27, a research assistant, who with Dr. Julius A. Stratton '23 has made a comprehensive study of various types of fog. Their work was carried out with the aid of a specially designed microscope. Natural fog is allowed to drift across a flat glass slide on which the microscope is focussed. An extremely thin coating of grease on the slide catches individual fog particles in much the same manner as insects are trapped on sticky paper, and prevents the droplets from spreading.

Fine lines representing the micron scale are ruled upon this glass slide. The light is so arranged as to illuminate the particles and the scale, at the same time leaving the glass slide dark. The effect is much as if the sky were divided off by ruled lines across which planets of various sizes might drift in their courses. Thus on the glass slide the size of fog particles is determined at a glance by watching the lines on or between which these fog droplets lie. A hundred or more such particles may be measured within the space of a few minutes.

This research has revealed that every fog is composed of particles of various sizes. One size, however, usually predominates. This predominating particle size is found to vary with different fogs. Hitherto it was believed that fog was composed of particles of discrete size.

Studies of the transmission of light through fog indicate that fogs composed of comparatively large particles are most

easily penetrated by red light. On the other hand, in fogs of very small droplets, green light is found to be superior. These observations show that the particular color of light best suited for signalling in fogs depends upon the composition of the particular fog.

It is a well-known scientific fact that fog cannot form in absolutely clean air. It is necessary for the atmosphere to be filled with fine particles, which are the nuclei on which the infinitesimal droplets take form. Further study at Technology revealed that salt, invisible grains of sodium chloride, tossed into the air from breaking waves, are the cause of most sea fogs. These particles are so fine that, once released from the water, they float in the air indefinitely.

It was also determined that the humidity of fogs is not always 100%. Observations during one particularly heavy fog over the sea at Round Hill showed the humidity to be 90%. This indicates that the tiny salt particles which form the nuclei of fog droplets are hygroscopic, that is, have the power to draw water from air which is unsaturated.

Appointed

Professor Robert F. Elder, Assistant Professor of Marketing in the Department of Business and Engineering Administration, has been appointed a Vice-President of the American Marketing Society and Chairman of the New England section of the society. The organization was established in 1931 for the advancement of scientific methods in marketing. Professor Elder's work at Technology and his studies in marketing have brought him wide recognition.

For Research in Spectroscopy

Dr. Joseph C. Boyce, who has been closely associated with President Compton in research work in spectroscopy of extreme ultraviolet light and of soft x-rays, recently arrived at the Institute, where he will continue his research in this field. He has been under appointment since October as Research Associate in the Department of Physics, but during the first term remained in residence at Princeton University.

While at Princeton, Dr. Boyce carried on to final stages the construction and adjustment of a large vacuum spectrograph of unique design. This instrument has been developed during the past three years with the financial assistance of the Carnegie Institution of Washington, under the supervision of Dr. Compton, who is a research associate of the institution. With the completion of Technology's new spectroscopic laboratory, this spec-

trograph was moved to Cambridge and installed in quarters especially provided for it in the new building.

Dr. Boyce received the degree of Doctor of Philosophy from Princeton University, and supplemented this training with two years of study and research at the University of London and at Cambridge University in England. Since that time he has been an instructor and later research associate at Princeton University. He has an unusually wide acquaintance with physicists and physical laboratories of America and Europe.

In collaboration with Dr. Compton, he has designed and constructed a spectrograph which gives an unusually wide range of spectrum measurement combined with high precision. At the same time he has devised and has been the first to apply to the extreme ultraviolet region of spectroscopy certain methods for controlling the excitation of spectra so as to eliminate impurities and to distinguish between the spectra arising from a neutral atom, or an atom which has lost one electron, or an atom which has lost two, or three, or four electrons.

This new activity will supplement an active program in spectroscopy at the Institute, including work with other types of vacuum spectrographs, which is under the general direction of Professor George R. Harrison, Director of the laboratory.

Business Conference in New York

A large group of Alumni attended the All-Technology Business Conference held by the Departments of Economics and Business and Engineering Administration at the Technology Club of New York on February 24. President Compton presided, and in a brief address he said that the conference was an indication of the desire of the Institute to keep the Alumni in close contact with the progress of Technology.

Addresses on the general subject of "Management Policies in a Period of Uncertainty" were given by Dr. Davis R. Dewey, Head of the Department of Economics; Professor Erwin H. Schell '12, Head of the Department of Business and Engineering Administration; Professor Floyd E. Armstrong, Professor of Political Economy; Professor Wyman P. Fiske, Assistant Professor of Accounting; and Professor Robert F. Elder, Assistant Professor of Marketing.

Members of the Advisory Committee of the Department of Business and Engineering Administration who attended the conference were: Charles A. Stone '88, Chairman of the Board, Stone and Webster Corporation; Fred W. Shibley, Vice-President, Bankers Trust Company; John R. Macomber '97, Chairman of the Board,

Chase Harris Forbes Corporation; and John E. Aldred, President, Aldred and Company.

The great interest of the group in this conference was indicated by many requests that the addresses be made available in printed form.

The President of the Technology Club of New York is Richard H. Ranger '11, and the committee on arrangements for the conference included Anthony Anable '20, Prentice D. Ash '20, John W. Barriger '21, Thomas D. Brophy '16, Lawrence B. Davis '22, Duncan R. Linsley '22, Richard O. Loengard '17, James A. Lyles '27, A. Warren Norton '21, Lyall L. Stuart '21, and Richard P. Windisch '21.

Honored

Professor Charles B. Breed '97, Professor of Railway and Highway Transportation in the Department of Civil and Sanitary Engineering, has been elected an honorary member of the national organization of Chi Epsilon, honorary civil engineering fraternity.

Professor Breed is a member of the American Society of Civil Engineers, the American Railroad Engineers Association, and is a former president of the Boston Society of Civil Engineers, the New England Railroad Club, and Boston City Club. He has been on the teaching staff of the Institute for 32 years. His work in engineering has been widely diversified, including grade crossing elimination work in 18 cities, bridge foundations and harbor dredging, landscape architecture, engineering arbitrations, and railroad construction.

Chi Epsilon was founded at the University of Illinois in 1922, and the M. I. T. chapter was established in 1928.

T. C. A. Elections

E. Arthur Hungerford, Jr. '33, of Harmon-on-Hudson, N. Y., was chosen President of the Technology Christian

Association at the recent annual elections. Wendell C. Allen '33, Newton, became Vice-President, and Charles B. Bryan '33, Cambridge, was made Treasurer.

An Educational Opportunity Accepted

Technology's offer of free courses for unemployed engineers and architects, which began on February 9, brought a quick response, and nearly 200 men are now taking advantage of training which is expected to prove of great value upon the renewal of activity in the various fields of engineering.

These men have come not only from Greater Boston, but from all parts of New England. The Institute's offer of these courses has brought much favorable comment from the press. The Springfield Union, in an editorial which has been widely copied, has this to say about Technology's contribution:

"Massachusetts Institute of Technology, which has been ready and resourceful in extending aid to industries, has now offered free courses to unemployed engineers and architects. . . . Twelve courses have been started, to run until May 25. In all of these, faculty members will bear an active part.

"In this way the Institute is acting in conformance to its traditional spirit in meeting the emergencies that arise. The largest benefits, presumably, will be experienced in our New England area. Technical men will be in a better position to discharge the problems attendant upon an industrial and business revival, and they and the community at large will be permanently benefited and strengthened as a result. . . .

"A silver lining in the cloud of temporary business adversity is seen in the opportunity that many persons and organizations are utilizing to make unemployment serve as an occasion for systematic self-education. Public libraries note this definite trend.

"It is fitting that professional men as well as wage earners should be alive to this possibility. Engineers and architects have been particularly hard hit because of the arrest of building operations in some fields. The example set by Massachusetts 'Tech' might be followed with good results by other institutions in a position to lend a hand along such constructive lines."

A Distinguished Lecturer in Physics

Professor P. Debye, Head of the Institute for Experimental Physics at the University of Leipzig, began, on February 12, a series of lectures on "X-Ray Scattering and Molecular Structure," to be given in the Department of Physics at the Institute for ten weeks.

Previous to occupying his present position at the University of Leipzig, Professor Debye was Head of the Department of Physics at the Institute of Technology in Zurich, Switzerland. He also has been connected with the University of Göttingen. Dr. Debye's outstanding contributions to science have been made in the fields of x-rays and crystal structures, and he has recently extended his investigations to the structure of molecules. He is the author of the currently accepted theories of dielectric phenomena and of electrolytes, and has written a book on "Polar Molecules."

Dr. Debye visited Technology eight years ago, at which time he delivered a similar series of lectures.

Communications Colloquia

"Timber Products in Communications" was the topic of a colloquium conducted by Dr. R. H. Colley of the Outside Plant Development Department, Bell Telephone Laboratories, under the auspices of the Department of Electrical Engineering on February 29 and March 1. The colloquium constituted the first of a series of three on "Recent Developments in Outside Plant Practices" led by members of the Bell Telephone Laboratories staff.

Dr. Colley's discussion included sources of timber supply and the various methods of manufacturing timber products. He also spoke at length on the causes and prevention of timber deterioration, on specifications, and appropriate timber utilization.

Dr. C. D. Hocker, Ceramics Apparatus Engineer, led the second colloquium of the series on March 14-15, when he discussed "The Use of Some Ceramic Products in the Telephone Industry."

"Corrosion Problems in Communications" was the topic of the third colloquium, conducted by Dr. R. M. Burns, Assistant Chemical Director, on March 28 and 29.

On April 11-12, Elbert H. Bancker '18, Central Station Engineering Department, General Electric Company, will lead a colloquium on "Protective Relaying."

The final colloquium of the year will be led by E. W. Dillard, Electrical Engineer, New England Power Engineering

SCHOLASTIC DATA: UNDERGRADUATE LOAN and SCHOLARSHIP HOLDERS* (as of end of First Term 1931-32)

No. holding Loans	Average Rating Loan Holders	No. holding Scholarships	Average Rating Schol. Holders
SENIORS 142**	3.41	112 **	3.69
(upper third of Seniors: 3.53 to 5.00)		(upper quarter of Seniors: 3.70 to 5.00)	
JUNIORS 124 **	3.42	96 **	3.76
(upper third of Juniors: 3.38 to 5.00)		(upper quarter of Juniors: 3.55 to 5.00)	
SOPHOMORES 94	3.32	101	3.62
(upper third of Sophomores: 3.25 to 5.00)		(upper quarter of Sophomores: 3.43 to 5.00)	
FRESHMEN 7	3.49	15	3.87
(upper quarter of Freshmen: 3.44 to 5.00)		(upper quarter of Freshmen: 3.44 to 5.00)	
Totals 367	3.39	324	3.70
(upper third of ALL Undergraduates: 3.36 to 5.00)		(upper quarter of ALL Undergraduates: 3.54 to 5.00)	

* Exclusive of 15 holders of Cambridge Scholarships who averaged 3.30; and 13 women holding scholarships awarded from special funds who averaged 3.48.

** Exclusive of men in Coöperative courses who were not in residence at Cambridge during First Term and for whom grades were not reported.

and Service Corporation, on April 25-26, when he will discuss "Electrical Engineering Aspects of Power System Development."

Passenger Airships of the Future

The future of transoceanic travel by Zeppelin airships was discussed by F. M. Harpham, Vice-President of the Goodyear Tire and Rubber Company and the Goodyear-Zeppelin Corporation (of which Paul W. Litchfield '96 is President) in the third Aldred Lecture at the Institute on February 26.

The great airships of the future, he said, will be designed to carry from 80 to 100 passengers and 10,000 pounds of mail and express. They will offer fast transoceanic service for those to whom time is of great importance. He believed that such ships would have a speed of 74 knots an hour, as compared with about 24 knots for steamships.

Of particular interest was his description of 500 theoretical transoceanic flights made by two experienced airship pilots and carried out by means of intensive study of weather maps covering all parts of the North Atlantic at all seasons. These studies indicated that eastward flights to Europe could be made in 60 hours, and that westward trips to America would require 75 hours.

A survey of transatlantic passenger travel showed, Mr. Harpham said, that steamships carried 100,000 first class passengers a year. Zeppelin passenger service to Europe could be established on an economic basis with an annual passenger list of 4,000.

Before such lines can be started, however, new laws covering the operation of airships must be enacted, for under the present statutes these great lighter-than-air craft are not covered by the laws which govern the operation of steamships.

Mr. Harpham has been a director of the Goodyear Company for many years, and since 1929 has served as Vice-President of the organization and its subsidiary, the Goodyear-Zeppelin Corporation. He has made a special study of the use of airships for transoceanic passenger travel, and in 1931 was the guest of Dr. Hugo Eckener on a trip from the United States to Germany aboard the Graf Zeppelin.

Sunday Concerts

More than 500 members of the Institute Faculty, Alumni, and dormitory residents attended the first of a series of two Sunday afternoon concerts by the Combined Musical Clubs in the main hall of Walker Memorial on February 28. Following the semi-classical program, tea was served, and the dormitories held open house for the remainder of the day.

The new concert series was undertaken at the suggestion of faculty members that a student social event be inaugurated to take the place of the Whiting concerts, which were last held in the fall of 1930.

FRATERNITY AND DORMITORY SCHOLASTIC STANDINGS

(as of end of First Term 1931-32)

Comparative Standing of 27 Chapters (based on February 1932 marks)	Increase over June '31	Increase over Feb. '31	Comparative Standing of 27 Chapters over previous five-year period
1. Sigma Alpha Epsilon.....3.22	0.13	0.26	1. Phi Beta Delta
2. Phi Beta Delta.....3.217	*0.053	0.267	2. Sigma Nu
3. Beta Theta Pi.....3.213	0.371	0.389	3. Alpha Kappa Pi
4. Kappa Sigma.....3.08	0.00	0.024	4. Sigma Chi
5. Theta Delta Chi.....3.07	0.23	0.39	5. Sigma Alpha Mu
6. Sigma Chi.....3.062	*0.128	0.132	6. Theta Chi
7. Sigma Nu.....3.05	0.00	0.11	7. Phi Gamma Delta
8. Alpha Kappa Pi.....3.02	*0.02	0.256	8. Sigma Alpha Epsilon
GENERAL AVERAGE			
ALL UNDERGRADUATES.....2.99	*0.10	0.07	
9. Phi Kappa Sigma.....2.95	0.18	0.05	9. Chi Phi
10. Theta Chi.....2.938	0.178	0.144	10. Kappa Sigma
11. Tau Delta Phi.....2.934	11. Delta Upsilon
12. Phi Mu Delta.....2.93	*0.20	0.13	12. Psi Delta
AVERAGE ALL			
FRATERNITY MEN.....2.91	*0.02	0.13	
13. Chi Phi.....2.91	*0.07	0.36	13. Phi Mu Delta
14. Phi Gamma Delta.....2.876	*0.084	*0.014	14. Beta Theta Pi
15. Phi Beta Epsilon.....2.873	*0.127	0.112	15. Lambda Chi Alpha
16. Psi Delta.....2.855	0.065	0.045	16. Phi Beta Epsilon
17. Alpha Tau Omega.....2.855	0.014	0.025	17. Tau Delta Phi
18. Phi Sigma Kappa.....2.837	0.257	0.137	18. Alpha Tau Omega
19. Delta Psi.....2.818	0.178	0.638	19. Theta Delta Chi
20. Lambda Chi Alpha.....2.806	*0.204	*0.104	20. Delta Kappa Epsilon
21. Delta Tau Delta.....2.775	*0.195	0.185	21. Phi Kappa Sigma
22. Delta Upsilon.....2.757	*0.214	0.137	22. Theta Xi
23. Phi Kappa.....2.732	0.052	0.312	23. Phi Kappa
24. Sigma Alpha Mu.....2.68	*0.55	*0.38	24. Delta Tau Delta
25. Delta Kappa Epsilon.....2.60	*0.47	*0.26	25. Phi Sigma Kappa
26. Theta Xi.....2.599	0.179	*0.061	26. Delta Psi
27. Phi Iota Alpha.....2.51	*0.15	0.24	27. Phi Iota Alpha

Comparative Rating System Average of Fraternity and Dormitory Undergraduate Groups

Fraternity Seniors.....3.188	*0.072	0.188
Dormitory Seniors.....3.18	*0.12	0.07
Fraternity Juniors.....2.967	0.057	0.207
Dormitory Juniors.....3.10	*0.02	0.13
Fraternity Sophomores.....2.855	0.135	0.255
Dormitory Sophomores.....3.07	0.08	0.20
Fraternity Freshmen.....2.765	*0.005	0.005
Dormitory Freshmen.....3.06	*0.06	*0.09
General Average.....2.91	*0.02	0.13
(Fraternity)		
General Average.....3.09	*0.06	0.05
(Dormitory)		

* Decrease

A Joint Meeting of Physicists

Important results of recent research in Physics were announced at the joint meeting of the American Physical Society and the Optical Society of America at the Institute and Harvard University on February 25, 26, and 27. More than 200 members of these societies from various universities and research laboratories attended the sessions, at which nearly 100 technical papers were presented.

The meeting opened at Technology on the morning of February 25 with technical sessions and the inspection of Technology's new spectroscopic laboratory. In the evening Professor Henry Norris Russell, the distinguished astronomer of Princeton University, delivered a lecture on "Revealing the Universe Through the

Spectroscope." His lecture was given under the auspices of the recently established American Institute of Physics, of which President Compton is Chairman of the Board of Management.

There was a joint dinner for members of the societies and their friends at the Parker House in Boston on the evening of February 26, during which the Frederick Ives Medal was presented to Professor Theodore Lyman of Harvard on behalf of the Optical Society of America.

On Saturday morning, February 27, Professor P. W. Bridgman, of the Department of Physics at Harvard, lectured on "Anomalies in the Behavior of Solids under Pressure," at a joint session of the two societies held in Pierce Hall at Harvard. The technical sessions of the societies on February 26 and 27 were held

in Pierce Hall, the Cruft Laboratory, and Jefferson Laboratory at Harvard, and the visitors inspected Harvard's new Physics Laboratory.

The scientists attended a luncheon at Walker Memorial at Technology on Thursday as guests of the Institute, and the next day were guests of Harvard University at a luncheon at Leverett House.

The officers of the American Physical Society include Dr. W. F. G. Swann, Bartol Research Foundation, President; Dr. Paul D. Foote, Gulf Research Laboratory, Vice-President; Professor W. L. Severinghaus, Columbia University, Secretary; and Professor G. B. Pegram, Columbia University, Treasurer.

Officers of the Optical Society of America are Dr. E. C. Crittenden, Bureau of Standards, President; W. B. Rayton, Bausch and Lomb Optical Company, Vice-President; Dr. L. B. Tuckerman, Bureau of Standards, Secretary; and Mr. Adolph Lomb '93, Bausch and Lomb Optical Company, Treasurer.

The New Spectroscopy Laboratory

Technology's new Spectroscopy Laboratory, just completed, is unique in many features of construction and scientific equipment. The building is 100 feet long, 60 feet wide, and two stories in height. Its chambers, enclosed by insulated concrete walls four feet thick, provide facilities for experiments of unparalleled delicacy in spectroscopy — the investigation of matter by study of the light emitted when electrons are hurled into the atoms of which it is composed.

The rooms of the laboratory are built like the box of a camera. They are light-tight, windowless, and devoid of columnar support. In certain of these chambers all air drafts and temperature fluctuations, both serious menaces to experimental accuracy, are completely eliminated. The thoroughness of the insulation provided can best be judged by the physicists' estimate that, in case all heat were suddenly shut off in Boston's coldest weather, it would take three weeks for the temperature in the central corridor to drop one degree.

The steps taken to secure the greatest possible measure of isolation from all vibration, as well as temperature insulation, are elaborate. The inner building and outer building have entirely independent foundations and there is no connection of any kind between them. An air space of six inches separates the two structures.

An electric heating system with thermostat control maintains a temperature at no time varying more than a tenth of one degree from 68° F. in the experimental rooms, while an automatic Carrier air-conditioning system provides a year-round humidity ranging between 35 and 45 per cent.

The walls and roof of the laboratory are built on outer wooden piles of their own, serving merely as housing around the workrooms. At no point do they touch the rigid floor foundation.

The extraordinary structure occupies a site entirely surrounded by massive Institute buildings, the heavy foundations of which serve to protect it from many of the earth waves beating in from adjacent highways and industrial plants. It is entered from the physics and chemistry building, another unit now being added to the Institute group, through a series of three doors, carefully designed to minimize drafts and temperature variations. As a final protection against extremes of weather, a steel umbrella roof caps the entire building.

On the ground floor of the building are two large spectroscopy laboratories which provide unusual facilities for the study of spectra. The light being studied enters the rooms through small openings and strikes what is known as a diffusion grating. This instrument is in effect a metal mirror six inches in diameter. Upon its face are 90,000 diamond-ruled lines, 15,000 to the inch. Upon striking the grating the light is broken up into the colors of the spectrum and reflected at various angles to photographic plates ranged about the rooms on circular tracks.

The central corridor of the building serves as a light source and control room. Here the various ducts of the Carrier air-conditioning system enter from an outside building. The walls are lined with switches and instruments, among them being a temperature recording instrument which shows the exact temperature in any of the rooms at all times.

In another laboratory is the vacuum spectrograph of unique design, mentioned above, developed by President Compton and Dr. Joseph C. Boyce for studies in the extreme ultraviolet region of the spectrum.

The 21-foot vacuum spectrograph designed by Professor George R. Harrison, Director of the laboratory, has been placed in a specially prepared room. This great tube rests on heavy concrete piers. Below it are arranged a series of pumps which exhaust the air from the spectrograph until only one part in ten million is left. This high vacuum is necessary because air is not transparent to light in the short ultraviolet region of the spectrum. The light being studied enters the long cylinder through a narrow slit at one end. The beam traverses the evacuated space, strikes a grating at the opposite end and is reflected back to a photographic plate at the end from which it started.

The engineering and architectural design of the new spectroscopy laboratory is the work of Charles T. Main, Inc., and the contractors were Stone & Webster, Inc. The intricate air-conditioning system was developed by the Carrier Corporation.

On Masonry Dams

Construction of the Hoover Dam in the Colorado River, largest project of its kind in the world, was described by J. L. Savage of the United States Bureau of Reclamation in the opening lecture of a course on high masonry dams on Febru-

ary 12. The address was given under the auspices of the Department of Civil and Sanitary Engineering of the Institute.

Mr. Savage, who is government designing engineer for the great Black Canyon project, illustrated his lecture with slides and motion pictures showing some of the tremendous obstacles to be overcome in constructing the 730-foot dam and its artificial reservoir of more than 30 million-acre-feet capacity.

The course on high masonry dams initiated by Mr. Savage's address will subsequently be conducted by Professor George E. Russell '00, of the Department of Civil Engineering.

Dormitory Dinner and Dance

The annual dinner and dance of the students of the Technology dormitories was held at Walker Memorial on the evening of February 12. The speakers at the dinner included President A. Lawrence Lowell of Harvard University, President Compton, and Professor Robert E. Rogers of the Department of English at the Institute.

Preceding the dinner a reception was held by President and Mrs. Compton, President Lowell, Mrs. James R. Jack, Mrs. Kathryn M. Wiswall, Mrs. Horace S. Ford, and Mrs. Leicester F. Hamilton.

Guests at the dinner included Mr. and Mrs. Francis R. Hart, Mr. and Mrs. Godfrey L. Cabot, Dr. Allan W. Rowe, Mrs. Ellen A. King, and Mr. Morris A. Parris.

Nearly 600 students and their friends attended this annual dormitory party, and there was dancing after 10 o'clock.

Chaperones included Professor and Mrs. Hamilton, Dean H. E. Lobdell, Mrs. Wiswall, Mrs. Jack, Professor and Mrs. Charles E. Locke, Mr. and Mrs. Wallace M. Ross, Mr. and Mrs. Delbert L. Rhind, and Mr. and Mrs. Pennell N. Aborn.

Health Education

Dr. Clair E. Turner '17, Professor of Biology and Public Health at the Institute, will preside as Chairman of the Health Section of the World Federation of Education Associations at its first regional meeting for countries bordering the Pacific, to be held next July in Honolulu. Members of the conference will discuss problems of child health, nutrition, the training of teachers in health education, and play activities of the child with regard to health.

Dr. Turner has been appointed to the Faculty of the University of Hawaii for the summer session, and will conduct courses in health education for teachers.

Society of Arts Lecture

"Light and Life" was the subject of the third Society of Arts Popular Science Lecture delivered at the Institute by Dr. John W. M. Bunker, Professor of Biochemistry and Physiology, on February 15.

Dr. Bunker first discussed regions of light and some effects of absorbed radiant energy on plants, including the formation of starch and chlorophyll, the chemical which gives foliage its green color.

He then described the chemical reactions of ultraviolet light, as well as its relation to pigment formation, vitamin D, and the stimulation of tissue cells in animals. One of Dr. Bunker's most interesting topics concerned methods of curing rickets, a disease which weakens the bones of growing children. He discussed bone formation and a mechanism of light therapy, and illustrated the development of a cell into an animal by the use of modeling clay.

Prize Winners

Awards by the Boston chapter of the National Association of Cost Accountants, announced on March 9, include three Technology students, whose essays won them prizes.

Henry W. Jones '26 (who holds the Francis W. Fabyan Fellowship) of Bethayres, Pa., was awarded the first prize for a paper on "Cost Analysis in Relation to an Adequate Price Policy." A second prize was given to John C. Leslie '28 (who holds the Alfred P. Sloan, Jr., Fellowship) of Minneapolis, Minn., for an essay on "Cost Accounting Aspects of a Selling Price Policy," and Francis A. Lutz, Brooklyn, N. Y., won a second prize for a paper on "Accounting Machines and Business Control." These three men are carrying on graduate work in the Department of Business and Engineering Administration.

The contests under which these prizes were awarded were open primarily to business men, and Jones, Leslie, and Lutz were the only students in the list of seven prize winners.

Colonel Locke Visits Alumni Groups

Colonel Frank L. Locke '86, Personnel Director of the Division of Industrial Cooperation and Research, returned on February 28 from an interesting visit to various Technology groups in the Middle Atlantic States. The trip was made in connection with his attendance at conferences in Pittsburgh of the American Management Association, and in Washington of the American College Personnel Association.

Colonel Locke reported that the two-day conference at Pittsburgh was unusually interesting and instructive. Of

particular significance were reports and papers by personnel officers in industry. Some of the topics were: "Supply of and Demand for College Graduates;" "What Does Business Seek in the College Graduate?" "Providing Information Concerning Business to College and University Students;" and "The Employment Procedure."

At the three-day conference of the College Personnel Officers, papers were presented upon "Placement of the College Graduate after College;" "Making Government Service Attractive to the College Graduate;" "The Adjustment of the Student in College;" "Aids in Interpreting the Individual to Himself;" "Work with Special Students;" "The Relation of Mental Hygiene to the Selection, Adjustment, Placement, and Progress of the Student;" "Who Should Go to College;" and "Adjustment, Selection, and Placement of College Graduates."

Very pleasant and profitable contacts were made by Colonel Locke with Alumni in New York. There was a luncheon meeting with the officers of the Technology Club and various calls on individual Alumni and personnel officers in industry.

In Philadelphia there was a dinner meeting with the officers of the Technology Club and several prominent Philadelphia men, followed by another dinner meeting at which there were present 25 Philadelphia Alumni. These included William H. MacCallum '24, President of the Philadelphia Club; Richard H. Pough '26, Secretary; Robert W. Weeks '13, former President of the Club; F. Gurney Fine, Jr. '26, Honorary Secretary of the Institute, and Isaac G. Swope '27. Colonel Locke also called upon Elisha Lee '92, Vice-President of the Pennsylvania Railroad; Philip H. Chase '09 and George E. Whitwell '15, both of the Philadelphia Electric Company; and John H. Rankin '89, of Rankin and Kellogg.

At Harrisburg there was a luncheon meeting at the University Club, attended by about 20 men, among them Farley Gannett '02; Frederick A. Robinson, Jr. '12; Louis S. Morse '96, Executive Engineer, York Ice Machinery Company; Percy E. Tillson '06, Engineer, Bell Telephone Company; Eldor J. Mink '22; and Maurice W. Davidson '26, President and Secretary of the Technology Club.

A luncheon meeting attended by 16 men was given in Pittsburgh, followed by a dinner meeting at the University Club with 25 men present, among whom were Joshua C. Whetzel '17, President of the Club; Francis J. Chesterman '05, Vice-President, Bell Telephone Company;

John T. Nichols '22, Honorary Secretary of the Institute; Morris Knowles '91; William E. Mott '89, Director of the College of Engineering, Carnegie Institute; Francis C. Foote '16, Vice-President of the Club; and William H. Reed '27.

In Washington a luncheon meeting was arranged with some 30 men, including Harry W. Tyler '84, President of the Club; Proctor L. Dougherty '97, Honorary Secretary of the Institute; Major Amasa M. Holcombe '04; Frederick H. Newell '85; Allen B. McDaniel '01; William M. Corse '99; and Paul Weeks '02. Calls were made upon prominent Alumni and public officials.

A luncheon meeting at the University Club in Baltimore was attended by 32 men. Among those present were William T. Biedler '10, Paul B. Thomas '16, James M. Bugbee '18, Frederick B. Wood '09, W. Watters Pagon '07, Richard Mommers '98, and Frank E. Richardson '16. Calls were made upon others, including Frederick W. Wood '77, former President of the Maryland Steel Company, now a trustee of Johns Hopkins University.

A very interesting meeting was held at Wilmington, Del., where some 25 Alumni assembled as guests of Willis F. Harrington '05, Vice-President, du Pont de Nemours Company, and Honorary Secretary of the Institute. Active interest in Technology affairs was evident on all sides. Among those who attended were Walter J. Beadle '17; Joseph Bancroft '97; Jasper E. Crane '04; Henry B. du Pont '23; Roger Williams '14, Chemical Director, du Pont Ammonia Corporation; Richard G. Woodbridge, Jr. '07, Chemical Director, Smokeless Powder Department, du Pont Company. Calls were made upon Pierre S. du Pont '90 and Robert R. M. Carpenter '01.

In Colonel Locke's discussions with the Alumni groups, stress was placed upon the value of development of simple, smooth-working machinery to bring about more intimate cooperation in the interests of the Institute, of industry, and of the Alumni. He suggested the benefits that might come from joint effort in the selection of the most promising type of student for the Institute.

Attention was directed also to the possibilities of bringing industry into closer contact with the Institute, with a view to strengthening the courses of instruction and aiding industry in securing trained men for special positions. The possibilities of extending services to industry through the Division of Industrial Cooperation and Research were also emphasized. Instances of such industrial aid were cited by Colonel Locke.

ADVERSARIA

Honored

¶ **SANFORD E. THOMPSON** '88 and **LEONARD C. WASON** '90, by receiving honor awards in the American Concrete Institute. Mr. Thompson, President of Thompson and Lichtner Company, Inc., Boston, achieved this honor "in recognition of a quarter of a century of service in the advancement of knowledge of concrete through his writings." Mr. Wason, President of Aberthaw Company, Boston, received his award "in recognition of two decades of guiding influence in the building of the Institute, and his service as its second President."

¶ **WILLIAM D. COOLIDGE** '96, by receiving the Washington Award from the Western Society of Engineers. This citation was in "recognition of devoted, unselfish and preëminent service in advancing human progress."

Written

¶ By **MAX KUSHLAN** '11, a "Handbook of Industrial Electricity," published by McGraw-Hill Book Company.

¶ By **CHARLES H. CHATFIELD** '14, Professor in Aeronautics at M. I. T. 1926-29, and **CHARLES F. TAYLOR** '29, a book, "The Airplane and its Engine," published by McGraw-Hill Book Company.

Elected

¶ **FRANKLIN W. HOBBS** '89, again, as President of the National Association of Wool Manufacturers.

¶ **JOHN H. GREGORY** '95, to a directorship in the Society of Civil Engineers, to serve a term of three years and to represent its members from the states of Maryland, Virginia, and District of Columbia.

¶ **ISAAC T. HADDOCK** '03, to the Presidency of the New England Gas Ass'n.

¶ **ALBERT E. WIGGIN** '07, to the chairmanship of the Montana Section of the American Institute of Mining and Metallurgical Engineers.

¶ **ALLEN ABRAMS** '15, to the Presidency of the technical division of the American Paper and Pulp Association.

Deaths

¶ Reports have come to The Review since the last issue of the decease of the following:

¶ **WINWARD PRESCOTT**, of the Institute's Department of English and History, on March 1, as a result of the accidental discharge of an automatic pistol which he was cleaning. He had been a member of the Faculty since 1916, and was made Associate Professor of English in 1929.

Professor Prescott had been a member of the Advisory Council on Undergraduate Publications since 1923, and for many

years was its chairman. He was also an honorary member of the Alumni Association; of the Woop Garoo, the honorary Voo Doo Society; a member of Pi Delta Epsilon, national honorary journalistic society; of the Beaver Club; and of the Walker Club.

For some time Professor Prescott had been a collector of bookplates, and he possessed one of the largest collections in the country, containing the best of both American and European plates. He had published various authoritative papers and monographs on different phases of this subject. This winter he also published a textbook on report writing, which is now being used at the Institute. Another one of Professor Prescott's interests was the collection and study of short stories as a literary form.

¶ **TAKUMA DAN** '78, on March 5, as the result of wounds inflicted by an assassin. Baron Dan was the managing director of the vast Mitsui commercial interests. The House of Mitsui is by far the richest business organization in the oriental world. It controls mines, banks, railroads, steamship lines, factories, and commercial houses of all sorts. What the Standard Oil is in the popular mind to America — a dominating, all-powerful, far-reaching business organization — the Mitsui interests are to Japan.

Dr. Dan was born in 1858 and was sent as a youth to America to study mining engineering at Technology. He became technical officer at the Japanese Government Meteorological Observatory, and later was in charge of the great Miike coal mine, one of the largest in Japan. When this was purchased by the Mitsui Company, he entered the employ of that firm and was associated there until his death. His rise from an ordinary engineer to one of the highest posts in Japan and one of the important industrial positions of the world was indeed most remarkable.

Baron Dan was widely known among American business men with important interests in the far east. He came to this country in 1921 as the leader of a group of Japanese business men whose mission was to improve commercial relations between the two countries.

Technology men, who attended the World's Engineering Congress in Tokio three years ago, will long remember Baron Dan's hospitality. Professor Robert H. Richards '68 stayed at Baron Dan's home and in order to make sure Professor Richards was comfortable, Baron Dan had a new room built in his house for Professor Richards' exclusive use.

He was a great and good man, and he never failed to demonstrate his interest in M. I. T.

¶ **RICHARD W. LODGE** '79, suddenly, on February 17, in Redlands, Calif. Professor Lodge taught in the Institute's

Mining Department from 1889 to 1907, after which he went into the orange ranching business in Redlands.

¶ **GEORGE B. WILLCUTT** '83, on September 17, 1931, in San Francisco.

¶ **EDWARD G. THOMAS** '87, on January 19, at Toledo, Ohio.

¶ **ISABEL F. HYAMS** '88, on February 17. For many years after graduation she was associated with Mrs. Ellen Richards, Assistant Professor of Sanitary Chemistry at the Institute, in her laboratory work relating to public health. In 1895, Miss Hyams was the founder of the Louisa M. Alcott Club in the South End of Boston, established for carrying on child health education.

For 27 years Miss Hyams was clerk of the Boston Tuberculosis Association and had an active part in establishing the Prendergast Preventorium for Children and of the Sheltered Workshop for discharged tuberculosis patients unable to engage in industrial occupations.

¶ **HARRISON LORING** '89, on February 3, in Quincy. (See '89 class notes for further account.)

¶ **FREDERICK M. LEONARD** '94, on February 8, in Augusta, Maine. Mr. Leonard was a highway engineer, engaged in various civil engineering projects in Massachusetts and New York. He went to Maine about ten years ago and was employed in the roads department of the State Highway Commission.

¶ **LOUIS P. ANDRES** '95, on July 31, 1929. This has just been reported to The Review office.

¶ **EDWARD E. DENISON** '95, on September 26, 1931.

¶ **FRANK S. V. SIAS** '95, on January 29, in Los Angeles. For a long time Mr. Sias represented the Dayton, Ohio, Register Company with offices in San Francisco and Los Angeles.

¶ **CHESTER H. PARSONS** '97, on January 30, in New York. He was Vice-President and Secretary of the Parsons Machine Company, established by his father.

¶ **HENRY W. WESTCOTT** '02, on January 16, in Providence, R. I. He was connected with Brown and Sharpe Mfg. Company.

¶ **RAYMOND NEWCOMB** '19, on February 15, as a result of injuries received in an automobile accident.

¶ **CAROL L. STONE** '21, on January 5, as the result of injuries received in an automobile accident. Mr. Stone was connected with the Phelps Dodge Corporation.

¶ **DONALD E. LOVELL** '23, on September 4, 1931, in Schenectady, N. Y.

¶ **ARSEN B. SARKISIAN** '25, on February 23. He was a chemist for the Fiberloid Corporation of Indian Orchard, Mass.

¶ **RICHARD E. CONNET** '26, on February 9, in Providence, R. I.

¶ **EDWIN W. SOUTHWORTH, JR.** '26, on February 15.

NEWS FROM THE CLASSES AND CLUBS

1875

It is with profound grief that I have to announce the passing of our Secretary-Treasurer, Henry L. J. Warren, who died of a shock at the Brooks Hospital in Brookline, where he was recuperating from a minor operation. I saw him at the hospital several times and felt no doubt that he would soon be in better form than he had been for some years.

Henry was born in Charlestown, August 31, 1853, a son of George W. and Georgiana (Thompson) Warren. He graduated from Technology in 1875 in mining engineering after the regular four year course. After receiving his degree, he followed his profession with several engagements in the south and west. A bit of journalism, of ranching, and of railroad reporting gave him a wide and varied experience and made for him a host of friends. I know of no one who had more.

Henry was a genial, loyal, whole-souled, and level-headed fellow who was cordially welcomed by the many friends whose pathways crossed his. In fact, he spared himself no trouble in going out of his way to meet those he counted his friends. He will be missed and mourned by a wide circle.

As to his being a faithful Class Secretary, I do not think that I need go further than to point to the '75 class notes in the issues of *The Review* since he took up the pen dropped by Hammatt in 1927. Truly '75 has been blessed in her two secretaries of the past 50 years, for more devoted and efficient service cannot be imagined.

The President proudly announces the birth of his first grandson, Arthur Thomas Hibbard, son of Henry B. ('25) and Ruth H. Hibbard, at Newton, February 8, 1932. — THOMAS HIBBARD, *President*, 18 Fairfax Road, Milton, Mass.

1877

It is with regret that we announce the death of Edward G. Cowdery, on January 13. Mr. Cowdery, an authority on gas engineering, was engaged in this work at Toledo, Milwaukee, and St. Paul for a number of years. In 1907 he became Vice-President of Peoples Gas Light and Coke Company, Chicago, and served as President of that company from 1915 to 1919.

The following letter was sent to Kittedge from C. S. Bachelder, Napa, Calif.: "I can hardly express my pleasure in having met an old classmate and thank you heartily for the visit. It did me a world of good to meet you and your brother and son-in-law and am very sorry I cannot see you again before your return home.

"I passed examination at Yale University in 1871 but came to Boston and kept books for E. Soule and my brother-in-

law, who were the builders of Memorial Hall (dining hall at Harvard University) and the Palmer and Batchelder building in Boston during that year.

"I entered the M. I. T. Class of '78 making up my French (which was not required at Yale), taking a special course in chemistry. I continued as special during my second year, taking all the studies having special bearing on chemical lines but dropped military drill, though offered a 1st Lieutenancy.

"A chance remark in the laboratory and a \$5.00 bet that I could not get my B.S., but promptly taken by George Baldwin, caused me to consider it, although already loaded to the Plymsol mark. Consulted Professor Wing, who requested me to see him in the next few days, when I was told they never advised that course, nevertheless, would give me all the assistance they could. The result was that I attended lectures in all four classes. You can imagine that I worked every day that year and was successful. As I graduated with 1877, I chose that as my class, although 1878 was my real class.

"I left for the West on the second or third day after graduation, spending two months on horseback in the New Mexico and Colorado mountains — from Spanish peaks in New Mexico to Pike's Peak in Colorado. Our horses decamped and started homeward, so that the trip to North Park was abandoned and I continued by rail to California, arriving August 1, 1877, remaining in Napa one year, and leaving for San Francisco August 1, 1878, remaining there in a bank for ten years, later joining the Western Beet Sugar Company which afterwards was merged in the Spreckels Beet Sugar Company (having a 3,000-ton, 24-hour capacity).

"As soon as I can dispose of my holdings here, I hope to visit Washington, D. C., and New England. . . ."

The following letter from Raymond B. Temple gives an account of Francis Workman Temple, born August 5, 1848, died August 3, 1888. The genealogical account is quite clear. The connection with the Bancrofts would seem to confirm our belief that Francis W. Temple is our missing classmate. "Since receiving your letter of January 6, I have made some inquiries about Francis W. Temple who entered the Institute from Reading about the same time as my father, Arthur W. Temple (son of Roswell N. Temple). I have not been able to locate any of the old residents of Reading who might remember Francis W. The only clue I can give you is from the Temple Genealogy which mentions a Francis Workman Temple, born August 5, 1848; died August 3, 1888; married (1) Refiyita Sanchez (died 1869, no issue); married (2) Nettie Friend (no issue). Francis Workman Temple's father was Francis Pliny Fisk Temple of Los Angeles,

Calif. This Francis P. F. was born in Reading, Mass., February 13, 1822 and died April 27, 1880. He married September 29, 1845, Antonia Margarita Workman (born July 26, 1830, died January 24, 1892) of Los Angeles. The son, Francis W., was the second of 11 children.

"Francis W. had several uncles, aunts and cousins who lived and died in Reading. I knew several of them and their descendants, though all those who would remember Francis W. appear to have died or moved away. It is a little surprising that I never heard my father speak of Francis W. Of course I am not sure that this Francis is the person you are interested in, but it seems reasonable to think that a few years after his first wife died, he, being still a young man, may have decided to come East and reside in the town with his numerous relatives while he went to M. I. T.

"I do not know anything about his guardian, J. H. Bancroft. It happens that his aunt married Bradley Bancroft in 1837 and his cousin married Judge Solon Bancroft in later years. Bancroft and Temple were very common Reading names in the early history of the town. Francis W. Temple is a distant cousin of mine.

"In a recent issue of *The Technology Review* I read that you are at the head of three generations of Technology men. Congratulations! My own boy, Allan (18 years) entered Amherst College (not the Agricultural College) last fall. I am not sure what line he will work into. His roommate, by the way, is a grandson of Solon Bancroft, mentioned above."

The following letter from H. H. Carter will be of interest to the members of the Class. "Yours re. Johnny Correa received. Plimpton was born and brought up within one quarter of a mile of W. H. Reed of 65 Bainbridge Street. This locality was known as Honeysuckle Hill and if you will get in touch with Plimpton he may know who is left in the Reed family and also what they know of the history of Correa. I don't know them.

"Nothing of special interest for the Class. I bought a 38-foot cabin trunk cruiser in June and took it down to my place in Maine near Bar Harbor and used it all summer fishing and cruising. In October went out to my place in Saskatchewan and shot geese and ducks and prairie chicken. My 23d consecutive trip. In November I made my 33d consecutive visit to the Santee Club in South Carolina and shot deer, ducks, and snipe. In January came out to Honolulu where I have spent about 14 winters. I take a two-hour sun bath every day followed by a swim, and in general am enjoying the attractions of this most lovely winter place. Shall be here until May 1." — BELVIN T. WILLISTON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

1883

Last December, the Secretary heard from Dwight F. Boyden, who has changed his address to 3405 Greenway, Baltimore, Md. — Information has just been received that George B. Willcutt, who took mining engineering with us, died in San Francisco on September 17, 1931. Those of us who worked in the mining laboratory with him, will always have very pleasant remembrances of him.

A press clipping of January 23 gives an account of the finding of a painting by Tintoretto, which at that date was at the Art Museum. Mr. Charles Allerton Coolidge, who took a special course in architecture with our Class, appeared prominent with this art find.

Unless the members of the Class wish to keep their Secretary in the position of the Israelites in Egypt, who were compelled to make bricks without straw, it is hoped they will send in some information of interest from time to time. — DAVID WESSON, *Secretary*, 111 South Mountain Avenue, Montclair, N. J.

1887

It is with profound regret that the Assistant Secretary has to announce the death of another member of the Class, this time our dearly beloved Secretary, Edward G. Thomas, at Toledo, Ohio, on January 19. "E. G.," as he was universally known, has been our Secretary since the graduation of the Class nearly 45 years ago, and no man was more highly esteemed during that long period or rendered more efficient service as a Class Secretary than he. Funeral services were conducted at the residence of Mrs. Anna Fogg in Waltham, and were attended by President Taintor, Mulliken, Lane, Cole, W. H. Brainerd, and Very, of the Class of '87, and Col. Frank L. Locke of the Class of '86. Interment was in Waltham.

It is regretted that a sketch of his life is not available at this time, but will be included in the next installment of class news. — NATHANIEL T. VERY, *Assistant Secretary*, 66 Orne Street, Salem, Mass.

1889

Harrison Loring died on February 4, 1932, at the Quincy City Hospital where he had gone for an operation a fortnight or so previously. His death, however, was immediately due to pneumonia. The *Boston Transcript* contained the following, "He was a graduate of the Massachusetts Institute of Technology, Class of '89, but before finishing his course he spent a summer in Scotland where he gave special attention to ship building on the Clyde. Earlier he had studied at the Boston Latin School. When he finished his Technology course, Mr. Loring went into the business of his late father, Harrison Loring, who, for a long time, had been in the ship building industry in South Boston, where the son was born sixty-three years ago. His mother was Margaret Gardner of Nantucket.

"During the late war, Mr. Loring attached himself to the Shipping Board and was located at Washington and Philadel-

phia. At the time of his death he was at the Fore River plant in Quincy, where he was inspecting the work of construction of a large craft for the United Fruit Company.

"Mr. Loring is survived by his wife, who was Clara S. Plimpton of Roxbury; a son, Theodore P. Loring of Westfield; and a daughter, Miss Evelyn Loring of West Roxbury. There is also a granddaughter, Priscilla Loring."

William H. Dow was reelected President of the Portland Society of Natural History at the annual meeting this year.

Hobbs has been reelected as the President of the National Association of Wool Manufacturers. — WALTER H. KILHAM, *Secretary*, 9 Park Street, Boston, Mass.

1891

Roger W. Conant died on November 15, 1931, at 1453 Beacon Street, Brookline, at the age of sixty-two. He leaves a widow and a son, Richard W. Conant. Up to the last six months he was in good health and kept up his running and bicycling. For the last twenty years, since his employment with the Aurora, Illinois, Electric Railway Company as electrical engineer, he manufactured and sold electrical equipment which he invented, namely, a rail joint testing machine, a coil testing machine, and a pocket slide rule.

George Hooper writes from Pasadena, California — "The book of the Fortieth Reunion has arrived and I have taken great pleasure in looking it over. I have not yet gotten over my regret at not being present. The only 'out' which I see about it is, that the Historian has converted our first son into a girl, whereas the said first born is a stalwart young man, tall enough to look over his father's head, and now working for a Master's Degree in industrial chemistry, at the California Institute of Technology, some of whose bright lights, as you remember, are Hale, Noyes, and Tolman — all M. I. T. men.

"It might have been said regarding the Mechanical Engineering Society that this was originated by the '91 'Mechanicals.' I remember well the organization meeting in Dewey's lecture room on the first floor of Rogers. This Society I believe is yet in existence and going strong.

"For personal news would say that I have been enjoying myself with my family since ending my duties with the City. I was more used up than I imagined by my responsibilities and, with the excessively hot summer here, did not feel myself again until well into the autumn, when my wife and I made a long auto tour through the State, calling upon friends en route. This was very enjoyable. Since then I have been occupied in club and church activities, holding offices in both classifications.

"In my last letter, I spoke of the movement in this City for a 'Recall' of the Board of Directors who were responsible, among other things, for turning me out of office. Well, the thing was put through and on December 28th this Board was

voted out of office by a larger vote than that on which they went in. Reinstatement has been offered me, but I have declined it.

"In regard to weather, the far famed Southern California climate has certainly 'put on a show' in the recent past. Not only was the summer very humid and uncomfortable, but we awaked a few days ago to find about three inches of snow over everything. This had not happened for 50 years. The papers say that a hurricane visited Indio (Shattuck's home) unroofing buildings and blowing down many date trees. I hope that Shattuck's ranch did not suffer. (Shattuck has been in Beverly Hills for some time — Secretary.)

"It was pleasant to see Ball's letter in the Reunion number. I have most agreeable recollections of him, as he came occasionally to my home for dinner. Charley Aiken, when last here, recalled one or more of these occasions to mind, he also having been present.

"We miss Charlie Garrison out here and hope that he has not completely abandoned these parts. We look forward also to visits from any '91 men who will take time to look us up. Such visits always give me much pleasure."

A letter from Clouston Moore to Barney reads: "I have received the new Class Book. It is very complete. In the Gloucester pictures Ernest Libby was sitting beside me on the steps. The key to the picture names him 'Mitchell' instead of 'Libby.' A natural mistake as Mitchell, Libby, and myself were associated throughout the course, although at the end Charley Wood and myself collaborated on a thesis. By the way — that is my only literary effort which I ever saw referred to in print in after years. Somewhere I once saw a reference to 'Moore and Wood on friction of screw-thread — 1891!' Cliff Tyler, Charlie Wood, Leonard Wason, and myself were school-day associates at the old Brookline High. Cliff's death was very unexpected to everybody."

Ernest Hersam writes from the University of California: "I welcome most heartily your communication circular received a few days ago entitled, Class of '91, M. I. T. It is a pleasure always to get these communications from the East and home. The pamphlet, too, entitled, 'Fortieth Reunion,' I appreciate and prize very much indeed. Last evening I devoted almost my entire time to a study of it, to its pictures, portraits, and to the experiences of our classmates. Such a reading is a sort of sequestered communion for one removed from Technology as I am, and, as I felt it, it threw me into a mood of courage for bigger and better things than an individual can develop alone under the limitations of a single mortal soul."

Phillip Powers writes the following to Barney from Springfield, Mass.: "I am afraid I have been a pretty poor Technology man, but I, you know, was only there two years and don't believe that I was fitted for a scientific education. I have never been much in touch with any

1891 Continued

of the Class since I left, in fact, I don't think there is over a half a dozen that I have seen in all these years."

Sol Stix writes from Chicago: "Thank you for your birthday greetings. I celebrated the event by playing golf in a mild snow storm. We were the only players on the course, just two — but we enjoyed the experience. On Tuesday noons we have meetings of Technology men, but the attendance has fallen off during this depression. At times only two or three — ten or more would be considered a crowd. I am the only '91 man who shows."

"Sylvan is my cousin. I see him seldom as he lives in New York."

Billy Dart gives us a little more Class History to add to our records. "In looking over an old scrap book which I kept in my early days, I have discovered the following facts: The First Annual Dinner of the Class was held at the Thorndike February 21, 1888. The officers at that time were: President, Charles F. Hammond; Vice-President, Theodore Spencer; Secretary and Treasurer, P. W. Stanford. The Second Dinner was held May 26, 1889, at the Thorndike, the officers were the same, except that B. D. Blair was elected Second Vice-President. The First Reunion Dinner was held at the Parker House April 23, 1892, with William C. Dart, Toastmaster. The following toasts were responded to by the individuals named: The Institute, L. F. Verges; The Class, W. B. Trowbridge; Alumni, James Swan; Work (now and then); and F. C. Blanchard. A Reunion Dinner was also held at the Parker House on April 28, 1894."

A recent report of the Brookline Planning Board, of which Gorham Dana is Chairman, on the subject of widening Boylston Street to care for the Worcester Turnpike traffic, caused a very warm discussion in the local and Boston press. The Boston *Herald* in an editorial stated the Brookline Planning Board was "drunk with power" and wanted a "double barrelled speedway" through the town. The Planning Board Chairman replied that they had no power, but were simply suggesting a modern scientific plan for caring for traffic with overpasses where the cross traffic warranted them and islands around which the cross traffic could weave at other intersections. Safety, not speed, was the object and the plan proposed would eliminate all stop lights from the Newton line to Brookline Village.

Walter Hopton writes of his regret at not being able to attend our Fortieth. He tells of visits from Mr. and Mrs. Aiken at Syracuse and seeing Charlie's movies. — Recent visitors to Cohasset to see Barney are Howard and Mrs. Forbes, Rowland and Mrs. Barnes, George and Mrs. Holmes.

Barney attended the 110th Anniversary of the English High School (of Boston) Alumni Dinner at which Charles Hayden presented a bronze statue. Hayden, Barney, Gorham Dana and Gifford Thompson were all E. H. S., Class of 1886. — Shattuck writes from Beverly Hills, California, that he and Mrs. Shat-

tuck were feeling first rate again. They came up from the desert last May and hope to go back again soon.

Dennie, our Alumni Cheer Leader and former Secretary, sent in a clipping from a Portland, Maine, paper and said that he saw Joe Warren at a Technology meeting in Portland. "Joseph A. Warren was re-elected President of the Trustees of the Westbrook Memorial Library at the annual meeting on January 27th."

The Secretary attended the Annual Alumni Dinner and as he was the only '91 man there, sat with '90 and '92 — John Batchelder, Professor Hutchinson, John DeWolf, and others.

Pinto writes Dana from Rio de Janeiro, Brazil: "I appreciate the composite letter which the committee on class book '91 M. I. T. sent me from The Early Convalescent Home, Cohasset, Mass., containing five paragraphs, each being an expression of greeting from the members of the committee — yourself, Aiken, Hatch, Garrison and Barney. As I cannot reach every one of you I am sending this to Barney to please do it for me. I had the pleasure to receive a letter from Knowles, shortly after the Fortieth Annual Reunion."

Robert Ball writes to Gorham Dana from Cambridge, England: "I very much appreciate the honor you have done me in giving my scribble such prominence, particularly as I feel sure it prevented the publication of interesting reminiscences from other members of the Class. I did not know we had a poet and composer among us. It takes 40 years to fully develop our stride and there is no saying what latent and unsuspected talent still lies hidden among our members."

"You will find the building of a house a great joy and I hope, when completed, you will spend many happy summers in it. I am much interested in all you are doing and such useful work, too. Town planning is very much to the fore over here just now as so many of our bailiwicks have been injured by the lack of any comprehensive scheme and they have been allowed to grow up anyhow. We have a Cambridge preservation society here to prevent further encroachment by the speculator upon the amenities of the town, and some devastating proposals to vulgarize the neighborhood have been still born in consequence of the activities of the society."

Barney Capen adds the following about Roger Conant: "I was sorry to know of the passing of Roger Conant. We have missed him in recent years, but I recall what a good time he had at our first Cape Reunion, our Twentieth, where he rigged up a wireless receiving set in the Cotochesit Hotel and caught code messages from vessels off the Cape. Roger and I were quite closely associated in our freshman year as Captain and First Sergeant of Company A. We were also both members of Course VI. I have happy memories of Roger and shall remember him with affection."

In a letter to Barney from New York, dated February 19, Jimmie Swan writes as follows: "In looking over the Class

Book, I found that one of the boys had an office in the same building as mine — R. C. Mitchell. He was only with us during the freshman year, but I had a hazy remembrance of him on the football team. So later I called on him and spent a most delightful hour comparing notes and trying to remember. A few days ago he returned my call and we used up a lot of tobacco and spent the best part of an afternoon doing it. I believe he enjoyed the calls as much as I did — and that was a great deal."

"There are four or five others that I want to look up if the opportunity offers, particularly Blair, who lives in Philadelphia and whom I remember very pleasantly as a freshman. I have enjoyed the book very much and only wish I could see a lot of boys that I had almost forgotten, but whose notes and letters seemed to bring back quite clearly. . . ."

The Assistant Secretary received a very fine, kind letter with a handsome souvenir of Japan from Miss Maltby at Christmas. — David and Mrs. Ambrose made Barney a pleasant little visit February 22. — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R. I. BARNARD CAPEN, *Assistant Secretary*, The Early Convalescent Home, Cohasset, Mass.

1895

The Alumni Dinner, at the Hotel Statler, Boston, on Saturday, February 6, is a thing of the past. The attendance from some of the classes was woefully under par, '95 included, as only four men of our class registered. The four brave men were Gus Clapp, E. L. Hurd, W. S. Williams, and L. K. Yoder, and the record indicates all four did justice to the good dinner. Our table included Mrs. Frederick T. Lord and H. E. Worcester of '97; Edward Sturtevant, George W. Treat, and Paul B. Wesson of '98; and R. W. Chamberlain '31; and we all had a jolly good time.

Archer Estes Wheeler, consulting metallurgist in New York City, left for Moscow on February 4 to spend from two to three months in Russia, in connection with his work as Technical Adviser to the Soviet Government on non-ferrous metallurgy.

Your Secretary received a copy of the interesting special report of the State Water Policy Commission of the State of New Jersey. The consultants in this report were Frank A. Barbour, of Boston, and our John H. Gregory, Professor of Civil Engineering of Johns Hopkins University.

We also learn that at the annual meeting of the American Society of Civil Engineers, held in New York City on Wednesday, January 20, John H. Gregory was elected a director of the society to serve a term of three years, and to represent its members from the States of Maryland, Virginia, and the District of Columbia.

The American Society of Civil Engineers was instituted in 1852 and is not only the oldest but is also one of the largest engineering societies in the United States. John Gregory has been a

1895 Continued

member for many years, and served as President of the Maryland Section of the Society, and has on two occasions been awarded prizes for professional papers written by him and published in the printed transactions of the society.

The grim reaper still takes his toll! From the *Boston Herald* of January 31, we learn the news of the death of Frank S. V. Sias, aged 60, at Los Angeles, Calif., on Friday, January 29. Frank Sias was a native of Somerville, Mass., and son of the late Samuel S. and Harriet Cunningham Sias. Frank was in business in Boston, following his graduation with '95 and left for the west during 1922. For a long time he represented the Dayton Ohio Register Company with offices in San Francisco and Los Angeles. We will always remember Frank as the great impersonator of Billy Sunday.

Record is also made of the death of Edward E. Denison, X, who resided at the Cumberland Club, High Street, Portland, Maine. Denison died September 26, 1931.

Also we regretfully record the death of Louis P. Andres as of July 31, 1929. The last known address of Andres was 903 Boylston Street, Boston, where he was engaged with the General Oil Heating Company in March, 1926. Let taps be sounded. — LUTHER K. YODER, *Secretary*, Chandler Machine Company, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N. Y.

1896

The second installment of the report on the African trip by the Myron L. Fullers has been received, having been written shortly after Christmas, and picking up the story from where it left off last month as follows:

"Continuing southward from Sierra Leone on the West African coast, our first stop was at Monrovia, the capital of the negro republic of Liberia, founded by freed American slaves. Although now a century old, little progress has been made. The country is still without a railroad, has few highways, and except for the capital and a few small towns, differs but little from savage Africa. Even in Monrovia, the streets are merely broad avenues of grass through which a few wheel tracks and footpaths meander at random. The public buildings are very ordinary, and their 'White House' a commonplace affair on the veranda of which we saw the dusky president promenading in pajamas. Flags, drooping from their staffs, suggested our own stars and stripes until a breeze, blowing them out, showed only a single star on the field of blue. Like Haiti, Liberia became so entangled in debt a few years ago that Roosevelt had to send Americans to its rescue. Our stay was too short to permit a visit to the Firestone rubber plantation, some 50 miles in the interior, and one of the few modern undertakings.

"Running south, with tropical downpours by day and incessant lightning by night, we followed the sandy beaches, backed by low woods, to Cape Palmas,

then turned east into the Gulf of Guinea, skirting the Ivory Coast (French), so-called from the vast quantity of ivory obtained there in the early days. Elephants are now nearly exterminated, however.

"At Grand Bassam, the leading Ivory Coast port, we had our first experience in landing in a 'mammy chair,' resembling a sleigh with two seats facing each other and raised and lowered by a derrick on a steel pier extending beyond the surf. Swinging in the air thirty feet above the water is thrilling at first, but soon becomes as ordinary as riding in our elevators. The ships cannot come alongside the pier because of the big swell of the open coast, all freight being transferred to small boats and lifted from them by derricks as in the case of passengers. Like all French ports of importance, fine buildings and large gardens predominate, with asphalt or cement streets lined with palms or other trees, over which thousands of bright colored lizards scramble. The French come to the colonies to live rather than for short stays, hence perhaps the superior character of their ports. Large quantities of mahogany are shipped, and giant logs, three to six feet in diameter, were pitched into the sea from the pier, to be picked up by launches and towed to the waiting steamers. Here the natives begin to affect a new type of costume, suggesting the toga of the Romans, with one end thrown over the shoulder. Little tram lines run through most of the streets, over which tiny cars carrying freight to the warehouses are pushed by natives.

"Christmas found us rolling at anchor a mile off the little British port of Winnebago on the Gold Coast, so named for the precious metal found in its rivers. There is neither harbor nor pier, and the freight and passengers are landed in long boats paddled with broad pronged trident-like paddles by nearly naked negroes in heavy surf, through which goods and people are carried to the beach on the backs of the blacks.

"Christmas dinner, including lobster, turkey, cranberry sauce and American ice-cream, was served in a dining room decorated with palms and flags, with the temperature between 85 and 90 degrees. For music we had the rattle of winches and the din of hammers against the steel decks and sides of the ship, for the routine never stops. Around us big sea-turtles, four feet long and nearly as broad, waited for their share of the festivities in the shape of refuse thrown overboard. The crew, dressed in their Sunday-best, planned to land and 'paint the town red,' but the port authorities, with recollections of former occasions of a similar nature, refused to let them even step on the beach. They partly made up for their lost fun by attaching frozen fish, sausages and bottles to the fish-lines which the captain dropped over the side.

"In the evening came a cigarette-scramble by the 60 native boys which we carry, some 30 packages being thrown in their midst. The scrimmage outdid the most hotly contested football game. The

THE TECHNOLOGY REVIEW

evening ended with a Christmas program from New York, perfectly received on a low-wave radio set.

"Tomorrow we are off once more, this time along the coast of Togoland and Dahomey. Have not seen a mosquito as yet, and no one has had even a touch of the fevers for which this coast is notorious."

Dan Bates is now back into activity again. He reports that he really had a tedious time, being laid up in the hospital for four weeks and then three weeks at home with a steel brace on his back, all with the object of getting his collar bone, which was broken into three parts, satisfactorily mended. The only reminder of his experience was that after such continued inactivity for an active man, the muscles of his left shoulder and arm were somewhat stiff, but this was gradually working off. He has never yet confessed how he succeeded in breaking his collar bone in three places.

Captain R. E. Bakenhus, who is at the New York Navy Yard, reports that at the annual meeting of the American Society of Civil Engineers in New York in January there is always a little gathering of '96 men, and this year as usual he made it a point to attend the annual luncheon and evening entertainment and found five fellows there beside himself. His further report is quoted verbatim:

"Charlie Trout who is an habitu  at these meetings was present in his full height and dignity wearing the badge of officialdom of the American Society. William Tully Dorrance came on from New Haven with his same old-time winning smile. Harold Stevens came in from the wilds of Long Island where he has a country home and is engaged in taking care of water supply problems of much of the Island. Boardman, who has reached the pinnacle of teaching service by being made a University president, namely — University of Maine — was also there, and I do not think he has lost his love for the engineering profession. The record of attendance from the standpoint of distance traveled is held by Charlie Hyde, who came on from the University of California at Berkeley. The Pacific Coast must be good as Hyde was the youngest looking member of the bunch and active and full of enthusiasm as ever."

The presence of Paul Litchfield at the big Goodyear conference in New York City was reported in the *Boston Globe*, January 16, together with a little story of Paul's life and accomplishments, and caused the Secretary to write to Paul for a little report. This has arrived, and covers a lot of activities in a brief and comprehensive way, as follows:

"I would say that for the last three years between 40 and 50 per cent of my nights have been spent on Pullman sleeping cars or boats. I spent a greater part of January and February visiting meetings of our salesmen and district managers in various parts of the country from New York to San Francisco. I spent two weeks in December on our 36,000-acre cotton and cattle ranch in Arizona, where we

1896 Continued

raise the long staple Pima cotton which goes into our pneumatic truck and bus tires, and in visiting our rubber manufacturing and textile factories in Los Angeles. A week in January was spent in Sales Conferences in Atlanta and in visiting our three textile factories in Georgia and our tire factory at Gadsden, Alabama. In between times I have been attending the New York automobile show, hearings in Washington before the Naval Affairs Committee and Ways and Means Committee on airships and excise taxes, and meeting of Directors of the Chamber of Commerce of the United States. Production at Akron is picking up somewhat in tire manufacturing and other allied rubber lines. The sister ship of the *Akron* now building here is about 25% completed."

One thing which Paul did not mention, but which was featured in the Boston *Globe* was the new Goodyear Airwheel tire to promote easy riding in low-priced cars. It is described as a great doughnut-shaped tire, being a further extension of the balloon tire principle.

At the annual Alumni Dinner in the Hotel Statler on February 6, '96 was represented by seven people. Butler Ames was present, and had planned to bring Mrs. Ames, but she was indisposed, so he had Joshua A. Holden as his guest. Jim Smyser and Mrs. Smyser, H. G. Grush, C. W. Tucker, and C. E. Locke with Mrs. Locke made the total. Rockwell had counted on being there, but unfortunately some emergency calls at the last minute kept him away.

The last '96 man reported on the air is Lythgoe, who as Director of the Division of Food and Drugs at the State House, Boston, gave a talk over WEEI on February 12, on the work of the State Board in cleaning up bakeries. This has resulted in a great change from the old, dirty, unsanitary bakeries, often found in cellars, to the modern, clean, airy bakeries.

Joe Driscoll accomplished one of the dreams of his life when he moved into an old mansion on Upland Road in Brookline. Joe has always wanted a large house, fitted up according to his own ideas, in which he could rattle around without bumping anyone, and the report is that he has certainly obtained his wish, and also that there is a strong latchstring which is always out for '96 men, and nothing will please Joe and Mrs. Driscoll more than for classmates to look in on them.

Billy McAlpine as United States Engineer on River Control has now been transferred to St. Louis. From his viewpoint, however, this is not of so much importance as the fact that he is now a grandfather twice over.

Lou Morse was in Boston in February and called on the Secretary on February 18, but unfortunately the Secretary was in New York that day and lost out. It seems that he was at Technology looking for some good material to enter the employ of his Company, the York Ice Machinery Corporation. He called the Secretary's attention to the fact that Dr.

Coolidge received another award on February 24, this being the Washington award from the Western Society of Engineers together with the four Founder Societies. This yearly award is in recognition of preëminent service on the part of some engineer in advancing human progress. Morse also reported that he hears at intervals from Con Young in Florida. Con's health has not been quite up to normal this winter and he was looking forward to a return to Cape Cod as soon as the weather became warm enough, as here it is that he enjoys the best health.

Russell Porter continues to get much publicity these days. The latest report is that he and Dr. John A. Anderson at the Mount Wilson Observatory in California built a gigantic burning glass made of 19 lenses, each two feet in diameter, and also 19 smaller ones, through which they were able to concentrate the energy of the sun's rays as much as 200,000 times, and obtain a temperature of 10,000 degrees Fahrenheit.

The Secretary has been trying to run down the report of Rutherford's death, but so far without success. He is still on the trail, and will hope to report something definite next month. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M. I. T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1897

We shall all be interested in hearing from our old classmate William Howard Gardiner, who has recently been in the public eye in Washington affairs. Billy, who is President of the Navy League, whose temerity in charging President Hoover with "abyssmal ignorance" of naval affairs started something that will end in sharp congressional debates, is author of the view that "North America, particularly the United States, has ceased being virtually self-sufficient and is taking on the character and outlook of a great island centrally placed in the oceanic world." He has now become President of the Navy League for the second time.

"Admiral" Gardiner, as his friends call him, is said to know as much about naval affairs as any real admiral in the Navy, yet he never has been a member of the service. A large U. S. Navy is his hobby in life, and he strives endlessly, through the Navy League, to make his dream a reality. The league is made up of returned naval officers and civilians.

It is with regret that we learned that our classmate, Ralph Vinal died suddenly of heart trouble in Winchester about a month ago. Ralph had an attack of heart trouble on his return from our Thirtieth Reunion and had been treated by Dr. Harry Goodall for the last several years, but it was thought, and he thought, there was no great danger if he were careful, so that his death came as a surprise to everyone.

He had no children, leaving only his wife. He was distinguished not only as an architect for fine residences, but as a

landscape architect and for a great many years had been employed by the City of Pittsburgh, Pa., to lay out their grounds and parks.

Charlie Breed has attained a new honor to add to the many that he already holds and is running a close race with our classmate, Hugh Moore. National recognition of his standing in the profession was recently accorded Professor Charles B. Breed, Professor of Railway and Highway Transportation in the Department of Civil and Sanitary Engineering at M. I. T. The unexpected honor came in the form of election as an honorary member of the national organization of Chi Epsilon, honorary civil engineering fraternity.

Only two other men, Dean Ketchum, head of the Engineering School at Illinois, and Dean Leland, who holds a corresponding position at the University of Minnesota, have been previously honored with this election. It is the highest honor the fraternity has at its disposal. — Professor Breed stated last night that the undergraduate members of the Technology chapter had apparently submitted his name without his knowledge to the Supreme Council, the national governing body. Election followed inspection by the Council of his past record and reputation. The certificate is dated January, 1932.

Chi Epsilon was organized about four years ago as a national fraternity, enrolling high ranking undergraduate students in civil engineering at many of the technical schools of the country. As is done in many of the honorary societies, outstanding members of the faculties of the several schools are initiated as honorary members. The other faculty members of the Technology chapter include Professors Charles M. Spofford, Head of the Department, John B. Babcock, III, and Walter M. Fife.

As this is written, the members of our Class around Boston are planning to pull off a reunion on March 5 at the Engineers Club. While full arrangements have not been made, it looks as though there would be about 40, including the wives, as it was decided to have the ladies at this meeting. A full discussion of plans for the Thirty-Fifth Reunion will be taken up. Although a large number of people have asked us to hold the reunion at their hotels, nothing definite has been decided. Professor William Spencer Hutchinson, Head of Mining and Metallurgy at M. I. T., will be the speaker of the evening and his talk on "A Journey to South Africa" will be illustrated by lantern slides. Charlie Breed, who has heard this talk, assures us that it is mighty interesting and instructive. — In addition to Professor Hutchinson, we have arranged to have Miss Erdman, who sang so beautifully at our meeting a year ago, with us again on this evening. We are expecting a great time.

Arthur Hopkins wrote on December 7 that he met Walter Spear in New York a couple of weeks ago and he asked Arthur what our plans were for the Thirty-Fifth meeting this summer, but Arthur was unable to give him much light.

Since that time, Wadleigh, Spear, and Vinton have been appointed a committee of three to stir up the New York crowd for our big outing and New York is now in touch with all that is going on. We hope they will pull off a good-sized crowd at a dinner in April to get a good-sized crowd for our Thirty-Fifth outing. — On the same date, Arthur advised me he met Howard and Mrs. Noble returning from a trip in France, Germany, and Italy. They stated that they had a very enjoyable trip and had gathered up a large quantity of antiques during their travels.

We hear from Proctor Dougherty that a short time ago he was designated by President Compton as one of the honorary secretaries of the Institute for the District of Columbia to contact possible candidates here in the high school who may be interested in attending Technology. It would appear that Proctor must be pretty busy in Washington in connection with his regular work and his many other interests, including the Presidency of the Washington University Club. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass. CHARLES W. BRADLEE, *Acting Secretary*, 261 Franklin Street, Boston, Mass.

1899

Some there were of '99 who heeded the lament of the Secretary. Whether goaded by fear or prompted by brotherly love they do not state, but enough members have sent in items so that Baron Munchausen's 1932 tales are crowded out of this issue at least.

Larry Soule, writing from 850 Frelinghuysen Avenue, Newark, N. J., has sent me a note and literature describing a new invention of Fan System Heat called "Flexitube Aerofin" and '99 men would do well to send for sample copies and see what Larry has been up to.

John B. Ferguson writing from Hagerstown, Md., stated that W. Z. Ripley, Professor of Economics at Harvard, but a graduate of M. I. T., was the sole speaker for the Annual Dinner of the Hagerstown M. I. T. Society which was held on Friday evening, March 4. Any members of the Class in the neighborhood of Hagerstown are cordially invited to attend these meetings.

In a recent issue of *The Review*, John Congdon noticed that he was among the missing, so he has hastened to inform me that he is very much present in the Providence factory of the U. S. Rubber Company to which he was transferred a short time ago. He tells me they have a small but live Technology Society which treats itself to a shore party once in a while. John has three sons — one is a freshman at Lafayette College, and one is a Junior at M. I. T. and manager of the Varsity hockey team. John will be glad indeed to see any of the Class at any time.

On February 21, Lew Emery gave another of his delightful recitals. Unfortunately I could not be in New York at that time, but hope for better luck on some other occasion. — John A. Walls, formerly of New York City, is now with the Pennsylvania Water and Power Com-

pany, 1611 Lexington Building, Baltimore, Md. — Edward A. Packard, also of New York, is now located at 730 15th Street, N. W., Washington, D. C. — Herbert A. Dakin, formerly of Chicago, is now at 123 Orange Street, Springfield, Mass.

Mail has been returned from the following men, and anyone knowing their addresses will be doing a good deed if he will send information to the Secretary's office concerning them: Leonard H. Field, Peoples Nat'l Bank Bldg., Detroit, Michigan. — B. G. Elliott, Newtonville, Mass. — Harry W. Goldthwaite, 105 West Adams Street, Chicago, Illinois. — W. MALCOLM CORSE, *Secretary*, 810 18th Street, N. W., Washington, D. C. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston, Mass.

1901

In view of the fact that it seems to be well nigh impossible to secure first-hand information about members of the Class, I am contemplating a little series of thumb-nail sketches of some of the class babies — I don't mean warm. Some such caption as "well-known sons of unknown sires" occurs to me as suitable for the series and would be used if I were sure that they would not fall into the hands of other members of the family. Far be it from me to create domestic discord. In any case it will probably not be necessary for me to decide upon a title until I get ready to reprint them privately.

As a suitable introduction I wish to say a few words about Charlie Record's son Eugene, better and more widely known as "Red." Gene is Captain of the Harvard track team this year and has been one of the brilliant performers in his several specialties since he entered the University and even before that as a schoolboy in the suburbs. Athletes can be broadly classified as runners and racers, the latter being differentiated by the unusual capacity of giving just a little more than they have when it is needed.

Two years ago I saw the boy run one of the finest indoor quarters that I have ever seen, the occasion being a relay race at the I. C. A. A. A. Meet and the Harvard team making a world's record on that occasion. Record ran against McCafferty of Holy Cross, one of the best quarter-milers of this day and generation. Record started with a small lead and held it to the end in spite of a most gruelling and unflagging effort on the part of his opponent. The story was repeated last Saturday night at the first intercollegiate track and field meet held under the auspices of the University Club of Boston. The same two were matched again, this time in the third leg of a mile relay which was the feature event of the evening. Record picked up with the pole and a stride advantage and by virtue of high courage and superb running handed over this advantage to the anchor man of the Harvard team. Both men deserve the highest praise for one of the finest races that I have ever seen. McCafferty on the outside ran stride for stride with Record practically the entire distance.

THE TECHNOLOGY REVIEW

It was the sort of Homeric battle that thrills one in the remembrance many years after the event.

Charlie was sitting in the grandstand and while he was obviously gratified, as God knows he had every reason to be, he maintained a dignified calm. Which makes me think of a scene that I witnessed at a Harvard football game many years ago when a stripling of some 225 lbs., a substitute put in in the last few minutes of play, kicked a goal from placement from the 45-yard line, bringing Harvard from behind to win the game. The father of the youth, excited by the prowess of his offspring, broke through his normal dignified reserve and throwing an immaculate hat to all of the four winds of heaven, raised his arms on high and murmured in a voice that shook the stadium, "My baby boy, my baby boy." Charlie undoubtedly felt that way about it — he looked as if he did — but he remained inaudible.

It was my privilege to observe this feat of one of the sons of 1901 and it has been a pleasure to record it. I hope it may stimulate other parents in the Class to send me other tales of their own olive branches since patently an inhibiting modesty prevents any more personal communication. I may say in passing that the sons and daughters of the Class whom I have had the pleasure of meeting are a particularly nice group of young people and reflect much credit on their mothers.

Freddy Coburn who had a boy in Technology a few years ago, "a prominent undergraduate" in his undergraduate days, writes in from a place called Birdsboro, Pa. Advancing years dim the memory but I certainly have seen the name of that town in a comic supplement. Well, anyhow, Freddy sends a welcome contribution to the finances of the Class but dulls my joy by adding "another in thirty years." While, of course, I shall be alive then I can't be sure of Freddy, particularly after seeing his game of golf at the Thirtieth Reunion. I suggest the establishment of a sinking fund in which the Class can have a reversionary interest.

The faithful Horace Johnson, another of the proud parents, two of whose youngsters contributed materially to Technology's swimming triumphs a few years ago, is still in Honolulu. With all of the interesting things that have been going on there recently, it does seem to me that Horace might have found something to add to the sole fact that he lives at 2953 Upper Manoa Road.

I hope after this letter appears in print that I shall be deluged with proud parental records. I would even accept the date of the cutting of the first tooth and a faithful and detailed account of how little Edward embarrassed his Sunday school teacher by a too searching inquiry into simple biology. In fact I should say send along anything you have and I will let the editorial board of the journal decide how far short of Ballyhoo they will draw the line. I hold out as a further inducement that I will consider taking on the

1901 Continued

grandchildren — in a purely clerical way you understand — after we have done justice to the second generation.

And anyhow and in all seriousness I wish you could have seen Charlie Record's boy run that race. It was a joy and an inspiration. — ALLAN WINTER ROWE, *Secretary*, 4 Newbury Street, Boston, Mass.

1902

Harry Pond has returned after four years in South America, where he represented the Barber Asphalt Paving interests. His headquarters most of the time were in Santiago, but he traveled extensively to the other large cities on the Continent. He reports that the only classmate he saw during his stay there was Farley Gannett, who was down in South America two years ago. An informal luncheon to meet Pond was held at the University Club, Boston, on February 3. Those attending were: Moore, Shedd, Philbrick, Patch, Smith, and Hunter. Pond can be reached for the present in care of his brother, Dr. Bernard W. Pond, 180 Huntington Avenue, Boston.

Word has been received of the death at Providence on January 16 of Henry W. Wescott. After graduating in Course II, he was for three years with the Howard and Bullough American Machine Company of Pawtucket, R. I., and since then has been with the Plant Engineering Department of Brown and Sharpe Mfg. Company of Providence. He was married in 1911 to Sara I. Underhill. A son, Henry W., Jr., was born in 1912.

Although the wind bites shrewdly, and there is a nipping and an eager air, as we write these words, it is less than four months to our Thirtieth Anniversary Reunion, which will be held on June 16-19. The place at which the reunion will be held will be determined in the light of replies received to the question raised in an issue of the Class Retort, which should reach you before this copy of The Review. The question is whether we shall meet at some shore resort in Connecticut or Rhode Island, or at some inland resort, presumably in the Berkshires. — FREDERICK H. HUNTER, *Secretary*, Box 11, West Roxbury, Mass. BURTON G. PHILBRICK, *Assistant Secretary*, 246 Stuart Street, Boston, Mass.

1903

Two members of the Class are much in the public eye at the present: Richard C. Tolman, X, and Raymond M. Hood, IV.

At the meeting of the National Academy of Science held in New Haven in November, Tolman suggested that one universe may expand in one part while it is contracting in another, and concluded that instead of coming to an end through loss of energy, may last forever because of the possibility that the process of changing matter into energy may be counterbalanced by a process of changing energy into matter. This is a great comfort to your secretaries, because it may give time to hear from everybody in the Class before the end of time. Dr. Tolman was one of the scientists in this country whom Professor Einstein came over to consult.

Hood is much to the fore at this time by reason of his being instrumental in making large changes to New York's skyline, and also as architect of buildings for the World's Fair in Chicago next year. It will be remembered that he put color into skyscrapers, making a 26-story building black and gold — one of the strikingly beautiful buildings of New York. The Boston *Globe* of November 9, 1931, gave an intimate picture of him as a typically "Busy American."

I. T. Haddock, V, was elected President of the New England Gas Association at its annual convention in Boston in February. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 89 Broad Street, Boston, Mass.

1905

Badminton must be a great game. See what a player, Marcy, has to say. "You bet men play badminton, when they are strong enough. Of course, leading a sedentary academic life like you do, you would have to build yourself up to it gradually. I suggest that you begin with ping pong, and if your degenerating heart can stand that, go on to golf, tennis, squash, football, and dog team driving. If you are still sound, try a few turns in the prize ring, and if you survive that, come up here and Hub Kenway, Grafton Perkins or I will give you a real sweat at badminton. It is the fastest game I ever tried and you certainly can get real exercise out of it."

Not having been trained on such taxing sports as cross-country, your scribe could not be expected to stand such a vigorous game. But Perkins gives some encouragement with: "To knock a shuttlecock around seems like child's play, but I can assure you that, with experts playing, it is the fastest, most exciting game I know of. I do not except championship tennis or pro hockey. Singles are almost too fast for old folks like you and me, unless in good condition or playing gently. Birds are the main expense, as they are somewhat fragile. One may last through several games or may break quickly. I'd guess that, once out of the dub class, you'd average three games per bird, at \$4.00 to \$6.00 per dozen. While fast, it is, for middle aged folks, (Why harp on that? Sec.) far less strenuous than squash. Playing as I do, one can play doubles for a couple of hours without fatigue. And it is far more sociable and fun-provoking than squash."

What neither one tells us is that badminton was introduced into England in 1873, before tennis was standardized, in fact when the latter game was played over a five-foot net on an hour-glass court. Why, then, are we only now hearing of badminton? The answer will be left to our trained investigators.

Henry Ayers, Vice-President of The Food Processing Co., 39 West 38 Street, New York, writes: "In 1930 I became connected with this organization which is engaged in developing processes for packing foods. One of these processes and the most interesting one, has nothing to

do with food freezing. (We thought it might have been the new freezing process that we heard of around Gloucester, Sec.) As a matter of fact it is just the reverse and is based on a new patented principle for applying heat to containers of food products in such a manner as to heat the contents, in approximately 15 seconds' time. This is accomplished by injecting steam in a specially designed machine through a valve in the container.

"Most of the past year has been devoted to studying the principles of this process and at the present time work is developed to a point where we now have a commercial machine which handles 30 cans per minute and which we shall have within the next six weeks operating in a commercial plant."

For seven years Bob Nichols has had a "Searsport, Maine, Please Forward" address, the significance of which was uncertain. Finally comes a letter from Bob reading "Box 223, Searsport, Maine, will get me." That's all. — Phil Hinkley thinks that the demise of the Tech Show, of which he was general manager, was due simply to the change of the times. — Dan Adams is now living in New Rochelle, N. Y. He is still with Lockwood, Greene, 100 East 42 Street, traveling between the Atlantic and the Mississippi. — Burton Greckler writes from Springfield: "Am plugging along so-so and that is as good as many are, no doubt, doing just now. Am feeling fine and still following the architectural game." — A note from Hallett Robbins, Glendale, California, says: "I am in part a gentleman of leisure, enjoying 'Sunny Southern California,' and in larger part, I am still serving the Oriental Consolidated Mining Co. as consulting metallurgical engineer."

Bill Motter and your Secretary again attended the Motor Boat Show in New York in February. Bill, you recall, is a power yachtsman and spends week-ends on his 40-foot cruiser. Maybe sometime he will try the Connecticut River. Out at Pelham Manor, where he lives, we had a delightful evening among thermometers, binoculars, barometers, hygrometers, cameras, compasses, course protractors, H. O. 208, to say nothing of Mrs. Motter and the charming little daughter. Bill has done some really notable work in photography, still and movie.

Louis Robbe wouldn't write so we tracked him down in his office, Room 614, Hall of Records, across the patio from that of the Sheriff of New York County. He is with the Board of Transportation, apparently head of the Planning Division. This we shall not guarantee, remembering the difficulty we got into with Percy Hill. Anyway, he has a lot to do with planning subways, bridges and tunnels, just now completing the latest tunnels under the East River. In spite of all this he looks remarkably youthful. And we hadn't seen him since graduation. Soon after Technology he was in the Pennsylvania Tunnels along with Gerry and Parker. Later he was at Gilboa, N. Y., with the Board of Water Supply but has been back in the city for some years. He lives in

1905 Continued

Larchmont and retains his interest in the military, being a reserve colonel, Corps of Engineers.

Robbe said that Jim Barlow, City Manager of Portland, Maine, for the last few years, had been a candidate for the recently created office of City Manager of New Rochelle, N. Y. A search of the Portland papers disclosed that certain conditions in city politics had caused Jim to consider resignation and that, when the news got out, there was such a protest that he decided to remain. The editorial comment could not have been more cordial. Space permits the inclusion of but one paragraph. "Mr. Barlow has proved a competent man for the position he holds. He has familiarized himself with city affairs and can be depended upon to do the right thing. He has tried to be diplomatic, but he has shown that he knows his rights and will insist upon them. Permitted to exercise his judgment he will do what is right and fair. We don't know what more could be asked for." — ROSWELL DAVIS, *Secretary*, Wesleyan Station, Middletown, Conn. SIDNEY T. STRICKLAND, *Assistant Secretary*, 20 Newbury Street, Boston, Mass.

1907

Last month, we recorded the death of Franklin Ripley. Now, through the courtesy of Mrs. Ripley, we are able to give the following facts, taken from the Keene (N. H.) *Sentinel* of January 14, 1932: "Franklin Ripley, life-long resident of Troy, N. H., and prominent in industrial, community, church, and fraternal activities of the town, whose business and social interests extended to Keene, died January 13 at his home in Troy, after a long illness, although confined to his bed only the past week.

"His only son, Franklin Fuller Ripley, junior at Dartmouth college, came home by airplane and arrived just in time to see his father before the latter died. Lee Bowman, of Springfield, Vt., a friend of the family, who owns a plane, was notified of Mr. Ripley's serious turn and flew to White River Junction, Vt., where young Ripley met him. The trip to the Keene airport was made in 40 minutes and an automobile was in waiting to take him to Troy.

"Mr. Ripley was President of the Troy Blanket mills where he learned the business under his father, Franklin Ripley, Sr., upon graduating from M. I. T. in 1907. He succeeded him as president in 1920. He was always well liked by the mill help, as well as business associates.

"He was born in Troy, December 5, 1882, and was educated in the Troy schools after which he attended Cushing Academy and then M. I. T. He was married on his 27th birthday anniversary to Miss Cora A. Fuller, December 5, 1909.

"Mr. Ripley was a past master of Monadnock Lodge, A. F. and A.M. of Troy, and was a member of the higher Masonic bodies, the chapter, council of Hugh de Payens Commandery, Knights Templar, all of Keene. He was an excellent musician, a fine player of both the organ and piano and he considered music

one of his hobbies. He played the Joel Poole memorial organ at the Keene Masonic temple on several special occasions. He was also organist at the Congregational church in Troy several years.

"He served as fire warden of the town several years and held other minor positions, but never aspired to the higher offices of the town though he was always recognized as a leader and consulted on matters of importance to the town.

"His influence extended beyond the confines of his home town. He was one of the incorporators of the Cheshire County Savings Bank of Keene, was an active member of several important committees of the Keene Country Club, a member of the Nashua Country Club, and Vice-President of the New Hampshire Manufacturers' Association.

"Mr. Ripley was a close, personal friend of the late Robert L. Whitney of Marlboro and the two were incorporators and trustees of the Elliot Community Hospital and worked together on the hospital financial campaign and were on important committees on equipment for the new hospital. Following the death of Mr. Whitney, Mr. Ripley was one of the chief workers in securing the ambulance and new laundry at the hospital which had been two of the chief aims of both men. Mr. Ripley resigned at the last annual meeting of the hospital due to ill health.

"Mr. Ripley was also actively interested in Camp Takodah and the Cheshire county 'Y' and Monadnock District Y. M. C. A. and was a member of the Camp Takodah council several years. His son, Fuller Ripley, was a camper for five years and a leader one year, and his brother, George K. Ripley, is president of the Monadnock District governing board.

"Mr. Ripley spent the winter in California three years ago and for the past two years had gone to Florida winters for his health and had planned to go there again this year."

Albert E. Wiggin, manager of the reduction department of the Anaconda Copper Mining Company of Great Falls, Montana, was elected chairman of the Montana Section of the American Institute of Mining and Metallurgical Engineers at the annual meeting held on February 2, 1932.

Again we refer to our Twenty-fifth Reunion to be held at Oysterville, Mass., June 17-19. After receiving our first bulletin, Bert Bancroft wrote me: "Your announcement of January 5 sounds like the real thing. June 17 ought to be easy to remember. Here's hoping you roll up a tidal wave of attendance that will, figuratively, sweep Bunker Hill off the map." — BRYANT NICHOLS, *Secretary*, 19 Rowe Street, Auburndale, Mass. HAROLD S. WILSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1910

A pamphlet has come to hand which is a report of the Traffic Association of Los Angeles of which Bob Breyer is President, having retired from the automobile business.

Andrew Fabens writes briefly: "For the past two years I have been executive secretary of the Wooster Board of Trade, Chamber of Commerce work. Very interesting. Have a wife and three children." — The following note is from Commander James O. Gawne: "Kept busy getting out the plans for the four 10,000-ton, eight-inch gun cruisers being built at the Navy Yards and in charge of one, the *New Orleans* being built at the Navy Yard, New York. Not too busy, however, to be always glad to see members of the Class of 1910."

Ralph George writes: "When reading the class notes in The Review I have noticed that they have been progressing alphabetically so your letter asking for items for the notes was not unexpected.

"I doubt if I can contribute anything which will be of interest for two reasons: first, I have not been engaged in engineering or technical work since leaving the Institute; and second, because of the fact that I attended Technology for only the last two years of the course, when one's associations tend to be restricted to one's own course and even to small groups in that course, my acquaintance with members of the Class was not very extensive.

"After graduating I returned to the Institute for two years as an Assistant in the Electrical Engineering Laboratory. When I gave up that position in 1912 I fully expected to continue in some branch of electrical engineering, but a combination of circumstances changed my plans and I became interested in the oil producing business here in the Bradford Oil Field and have been engaged in it since that time.

"Although this oil field is the oldest one in the country and one of the largest in area, its production is comparatively small and up to a few years ago the methods of pumping the wells and operations in general had changed but little. About 30 years ago it was discovered that the introduction of water pressure in a well would drive the oil toward other wells near by and increase the rate of production. This method of stimulating production was eventually legalized and, with the realization that this grade of crude oil will yield very superior lubricants for internal combustion engines, capital was attracted to the field and extensive and intensive production methods were developed very rapidly with a resulting large increase in production. Unfortunately the increase in production came when the depression reduced consumption and as a result our industry is not in a healthy condition at present, which, however, is not peculiar to it alone.

"I seldom meet any Technology men and it is a long time since I have seen any 1910 men. If any of the Class should happen this way, I should be glad to see them." — DUDLEY CLAPP, *Secretary*, 40 Water Street, East Cambridge, Mass.

1911

Eleven '11 men leavened the loaf at the '11 table at the Alumni Banquet at the Statler in Boston, February 6, and with

1911 Continued

Dennie in his accustomed cheer leader assignment at the head table and Skip Harrington, I, coming for the dance after dinner, we had a baker's dozen present. Those who brought the missus: Bill Coburn, I, Dennie, Sterling Dyer, II, George Estes, II, Roy MacPherson, II; the stags: F. C. Harrington, I, Art Leary, XI, and Emmons Whitcomb, X.

In New York a little over two weeks earlier, with good old Dick Ranger in the driver's seat as President of the Technology Club and toastmaster, 1911 as usual overflowed the table assigned to it and had a party of 20 there. This dinner was really a personal triumph for Dick and the writer certainly regretted that for the first time in more than five years he was forced to miss an annual New York Technology Banquet. However, Don Stevens was on hand and his story follows herewith.

"Dick has filled the office of President of the Technology Club of New York to everyone's satisfaction for several years, has devoted a great deal of attention, hard work, and time to the club, and has succeeded in maintaining it through a most difficult period. His ability to obtain coöperation, which resulted in an attendance at the annual banquet, 1932, equal to that of 1931, is evidence of his leadership. . . .

"The banquet was in very good taste — no whoopee in evidence, indicating a conforming to the common sense trend of the times. The speakers were fine and in particular one cannot help but feel impressed with the personal charm and inspiration of our new President Compton. It was quite an interesting event to see our executive head step out of office into the technical lab and yet it seemed simple and natural to watch President Compton leave the head table and go over and do the 'atom smashing' himself — even electrocute himself with a couple of million volts and live to tell the tale.

"During the evening music from the *Rangertone* electrical organ was transmitted from his home in Newark directly into the hidden amplifiers in the banquet room. Dick is now organizing a company to advance the possibilities of his invention and great interest is being shown by the musical and professional world. Broadcasts are heard weekly on WOR at 3:30 P. M. on Saturdays. The range of possibilities of the organ was demonstrated at the banquet and the audience greatly appreciated the music. When it is realized that with a few comparatively simple electrical devices the deep tone of an organ pipe 30 feet long can be duplicated, one appreciates the possibilities of the Ranger electrical organ.

" . . . Dick Gould showed up in time to see the atom smashed. Dick is chief engineer of the largest sewage disposal project in the world, that for the City of New York, and he had been toastmaster at a banquet of his own where he had introduced one of Jimmie Walker's Commissioners as the '*pièce de résistance*.' The title of his banquet ran something like this — Sanitary Engineering Section of the American Society of Civil Engi-

neers. However, he seemed to be carefree under all this load and all of 1911 enjoyed a very pleasant evening together."

Received a clever cartoon card from Ike Hausman, I, President of The Hausman Steel Company, Toledo, Ohio, with Ike out in front of his family holding a key on the end of a fishline and pole in front of two guests with the caption: "The Six Hausmans Wish to Present to You the Key to 181 Wellington Avenue, New Rochelle, New York." On the back of the card Ike wrote: "Five Toledo bank failures out of a total of seven has resulted in making me eastern salesman for my own company still operating in Ohio. We will try to replace our local business when, as, and if, conditions improve. Tell the '11 men, including yourself, to look me up at 342 Madison Avenue, across the street from Grand Central Station."

Harold Robinson, I, writes that he saw Phil Caldwell, I, recently in New London, Conn., and that he looks the same as ever. Phil is Vice-President of Robertson Paper Box Company, Montville, Connecticut. — From the Alumni Office we learn that Vernon Foster, VI, of whom we had lost track, is now with Canadian General Electric Company at Peterboro, Ontario. — Harry Tisdale, V, writes from Schenectady as February is ushered in, complaining of the lack of snow and ice, but from newspaper accounts upper New York State has had during February some real winter weather with snow and ice just as we have here at Douglas Hill. — ORVILLE B. DENISON, *Secretary*, Douglas Inn, Douglas Hill, Maine. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1912

Howard F. Clark, I, Captain, U. S. A., is now located at Fort Lewis, Washington. — George B. Brigham, Jr., IV, reports that he is now teaching architectural history and design at the University of Michigan, Ann Arbor, Mich. — Paul Jeffers, IV, says he has been sticking to structural engineering and has done his share of the building in the vicinity of Los Angeles, Calif. — C. T. Springall, IV, is engaged in the practice of architecture and is at present on building work at the Boston Municipal Airport.

Paul M. Tyler, III, has received visits in Washington, D. C., from Jim Morley, III, who is Superintendent of the American Rutile Company, and from Walter Triplett, III, about every other year when the American Metal people can spare him out of Mexico. Tyler is with the Bureau of Mines. — William R. Glidden, I, has a son in the Class of 1935 at Dartmouth College. — R. E. Wilson, II, reports "same old job, no change" (Well! most any job, old or otherwise, looks pretty good these days). — John W. Raymond, I, suggests we print up a notice "giving members of the Class hell for being such a dead bunch." (Come to the Reunion, John, and help us wake 'em up.)

Since our Reunion propaganda is being conducted by mail, independently of these news columns we will simply say here

that anyone who fails to receive mimeographed Reunion information through the mail should write at once to the Assistant Secretary (address below).

We have had pleasant visits from B. H. Morash, VI, R. J. Wiseman, VI, C. B. Vaughan, II, and Page Golson, VI. The last named, who is with Ford, Bacon & Davis, made a column in the New York *Times* recently with a statement opposing unfavorable regulatory legislation against public utilities which he claims is against the best interests of the public at large in the long run.

We acknowledge here, an interesting letter from Professor J. A. Allan, XII, who is now located in Edmonton, Alberta, Canada, as head of the Geology Department of the University of Alberta. We quote from his letter in part. "I expect to be in Boston and possibly New York about April of this year so that there is no chance of my attending the Reunion in June. However, if I get to New York this spring I will endeavor to have a chat with you. So far as I know, there are no other '12 men in Alberta. S. J. Schofield, XII, was the last classmate I saw. He is a professor of Geology at the University of British Columbia in Vancouver, where he has been for a number of years. I have been head of the Geology Department at this University (Alberta) since graduation in 1912, and in addition have directed Geological Survey work for the Research Council of Alberta and have also had a consulting practice.

"I have been Consulting Geologist for the Calgary Power Company for about eight years and had the privilege of looking after the geological work as to site and foundation and materials used for both concrete work and fill material in the construction of the Ghost Dam for this Company on the Bow River, 35 miles west of Calgary. This Dam has a total length of over 3,000 feet and was completed about two years ago. On the staff at this University there are three Technology men: I. F. Morrison, '11 (I), C. A. Robb, '10 (II), and A. E. Cameron, '25 (III)."

The New York City *Automotive News* recently carried a picture of A. G. Herreshoff, XIII. Herreshoff is now Vice-President and Chief Engineer of the Fargo Motor Corporation, and is rated as one of the foremost automotive engineers in the country. His first connection with gas engine work was with the Gas Engine & Power Company, builders of power boats and steam yachts at Morris Heights. Here he became associated with Harry Woolson, now Chief Engineer of the Chrysler Corporation. He worked with Mack Truck, Bethlehem Motor, and Fifth Avenue Coach Company, later becoming associated with the Chrysler staff.

Harold G. Manning, X, spoke before the New Haven section of the American Society of Mechanical Engineers at Yale University on January 22. His subject was "Patents and Inventions." Manning is an authority on the subject, as he rates LL.B., LL.M., M.P.L., in addition to his Institute S.B.

1912 Continued

Another man in the public eye is Frederick W. Barker, Jr., X, who has been advanced from his position of Assistant Vice-President to Vice-President of the First Trust and Deposit Company of Syracuse, N. Y. In addition to the above, Fred rates as Trustee of the Syracuse Savings Bank. — FREDERICK J. SHEPARD, Jr., Secretary, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, Assistant Secretary, McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York, N. Y.

1913

Class news for this month is more varied and interesting. I had a chat with our genial President, Bill Brewster, over the telephone from Plymouth the other day. Net result — Bill appearing at the January meeting of the Alumni Council. He looked well and talked quite happily about business in his line, as having turned the corner. — Joe MacKinnon, the registrar, bald as ever, sat with us. Also at our table was Professor Hamilton '14, Ken's brother, but we learn little about Ken. — Jim Russell runs in every once in a while. Jim has business relations with the Steam and Hydraulic Laboratories, making tanks, pressure vessels, welding operations, and so on.

In the corridor of one of the Chemical Laboratories at the Institute is a photograph of the 1913 group in Chemistry. Beneath the picture is a chronology of positions held by this group to date. Among those I recall included therein are: Kenney, Hirst, Bellis, Corbett, Hoyt, Mahoney, and Pendleton. There are some blank spaces in the chronology which need to be filled. Perhaps classmates will send in the necessary data.

I ran across Butsey Bryant the other night. He and his family were headed for a show, hence no time to chat. I see Al Brown and his wife, once in a while. He offers no news except that the Underwriters Laboratories are functioning under his supervision. — I heard that Eddie Hurst is now in Fall River in charge of the United Drug Plant in that city. — I have a friend in Dayton, Ohio, who comes to the Institute once in a while. He reports that L. L. Custer is alive and kicking, and running a thriving manufacturing business. Also that Custer is just as "original" as ever. — The Paris Edition of the New York *Herald* carried a column on the organization of a new University Club in that city. George Bakeman was one of the two Institute representatives.

Now for the main item. The following carries excerpts from a fine letter from George Leavitt. It is self-explanatory: "Here is the long promised letter you referred to in class notes a few months ago.

"I entered Technology with the 1912 Class and graduated with 1913. At the end of the course, in deciding which Class to affiliate with, it seemed to me logical to consider oneself as a member of the Class with which one graduated. All through life I have usually been 'true to my first love' so that it was not easy

to give up '12 for '13. I had sorrowfully seen '13 win Field Day from '12 and I thought that perhaps '13 might prove itself the better Class in other ways. This, I thought, would help to take away a little of the regret I felt at giving up '12. When '13 class notes dwindled from the Secretary's plea for contributions to nothing, month after month, while '12 had its fair share of notes, I was continually unhappily reminded of the selection I had made. I am happy to find '13 notes picking up now and hope the improvement will continue. I shall try to do my share. In fairness to myself I can say that, in one or two instances, I never did see any acknowledgment of notes which I had sent in.

"I am with the same concern I came with upon graduation, although reorganizations and changes of name have been effected. I am plant engineer with The Southern Cotton Oil Company, Bayonne, N. J. I am married, have four children aged eleven, ten, three, and one, all boys except the ten-year-old. I lost one daughter three years ago. I reside in Cranford, N. J., about 18 miles out of New York City.

"Our business, being food products, has not suffered badly at all. Wesson Oil and Snowdrift, our two nationally advertised products, are selling very well. A contingency fund helped us out materially in absorbing an inventory loss, and in making a favorable showing last year. Our company is conservative and thought best to reduce salaries last fall. Our outlook for the new year is good.

"I joined the A. S. M. E. four years ago and attended the annual meeting and dinner, where I met K. D. Hamilton. At the 'Mechanical Power Show,' the same year, I ran into Reid, II. M. W. Merrill, XIV, lives in Woodbridge, N. J., not far from my town. He and I started to school together in Salisbury, Mass., and were together through the grades and high school. He had to wait one year to enter M. I. T. on account of being under the age limit, but we both graduated in the same class. He is married and has four children, three boys and one girl, the same as I. The two families visit together often. The parallelism of our lives is a little odd I think.

"A year or so ago, while commuting, I used to see a fellow who reminded me of another classmate. As I did not seem to be recognized and as I thought the person in question was located some distance away, I decided it was a question of two persons looking alike. But one day this fellow came to me and identified himself as P. V. Cogan, II. Strangely, I do not recall seeing him again.

"I receive Christmas cards regularly from E. L. Hathaway, I, and A. C. Brown, I. Our wives correspond occasionally. Hathaway is in Chillicothe, Ill., and Brown is (or was) in Parsons, Kan. Brown has been working on railroad valuation work.

"I used to know something about E. E. Gagnon, but haven't heard about him for some time. News of Eddie Hurst, Lanning, Wood, Loeb, Nelson, or any

others of the Class would be interesting." Let us hope this letter has sown a seed on fertile ground. Perhaps classmates mentioned, as well as others, will continue the good work. — GEORGE P. CAPEN, Secretary, 50 Beaumont Street, Canton, Mass. ARTHUR L. TOWNSEND, Assistant Secretary, Room 3-435, M. I. T., Cambridge, Mass.

1914

Amid a pandemonium of 1,000,000 volts for ninety dollars, and amid a turmoil of decrepit atoms blating their death knell, the annual alumni prandial officially went into history, at the Hotel Statler, Boston, on February 6. Frightened off by the requirements of two tickets and perhaps the thought of being enveloped by a diseased atom, the Class of '14 was most conspicuous in its absence. Porter and Mrs. Adams, with your Secretary and Mrs. Richmond, alone perambulated from start to finish past the reception line, respectfully took their places at the '14 table, and with appropriate decorum represented our honorable class. To be sure, Doc Swift registered in the official '14 room at the hotel before the dinner, but during the repast graced the table of his second love — '15. With a dignity and an austere commensurate with his position as a professor and the official faculty intelligentsia of Institute dormitory life, Leicester with Mrs. Hamilton graced the special faculty table placed before the dais that some, at least, might hear two most excellent addresses, which those in the suburban sections of the ballroom enjoyed largely through cardiac emotions stimulated by the applause of those who heard.

The doctor who takes his own medicine is as rare as an editor who reads his own paper. In the February notes your Secretary told of the new allegiance of Deac Barns with Lord and Burnham, even to the giving of his latest address. At the end of these very notes, just three inches of delightful reading below the Barns item, The Review editors — at the direction of the Alumni Association Executive Committee, so they apologized — ask if anyone knows of the correct address of Barns. Every once in a while your Secretary reads a few pages of Review notes for purely mental discipline, and much as his official dignity was injured at the Barns incident, he finds it difficult to chide in the manner which the incident merits.

Pat Adams brought with him the grand news that Don Douglas, who has become so famous for his aeronautical designs, has just produced another great model — twins, boys we believe. Congratulations, Don!

Don Dixon had a narrow escape in February. While opening an oyster — Don is an all-year-round Cape Codder — his knife slipped, cutting his hand. A bad infection set in, and for a while Donald spent some very serious days in the hospital. Luckily he has now fully recovered.

Bill Price has moved up from Philadelphia to Newark where he is now Executive Vice-President of the Carrier-Lyle

1914 Continued

Corp., which is an outstanding pioneer in the equipment for air conditioning of residences and commercial buildings.

E. E. Snyder has moved from Syracuse to Troy, both of the Empire State. Snyder to date has resisted all attempts to learn of his new venture.

Carl Anderson has moved down from Kansas to Georgia where he has joined the Columbia Chemical Corporation, at Lumpkin. — HAROLD B. RICHMOND, *Secretary*, 30 Swan Road, Winchester, Massachusetts. GEORGE K. PERLEY, *Assistant Secretary*, 21 Vista Way, Port Washington, New York.

1915

Still another prospect for Technology! To Phil L. Alger, VI, and Mrs. Alger go our heartiest congratulations and sincerest wishes for Andrew Langdon Alger, born February 12. Phil announces the happy addition in this way: "The arrival this morning of Andrew Langdon Alger, brimming with optimism, has given Mrs. Alger and myself much pleasure. With our other three children, we now have a perfectly symmetrical family. The belated Christmas card enclosed will introduce you to them in person. I continue to enjoy my activities in the engineering general department of the General Electric Company. One of the most interesting of them at present is the promotion of noise reduction and noise standards. I regularly read your all-too-abbreviated notes in *The Review*. Perhaps an annual questionnaire sent to our wives would elicit more information on our goings on than comes from us spontaneously. We have built a summer cottage at Quincy, N. H., and would be glad to see any classmates who tour that way." His Christmas card shows three attractive children whose scrawled signatures indicate their tender ages. I hope some of us can accept his kind invitation for a summer visit.

The success of our class dinner in New York on February 18 at the City Club was due to the interest and efforts of Jim Tobey who made the preparations and did the work. An excellent dinner was enjoyed by Ed Fonseca, VI, St. Elmo Piza, IV, Jerry Coldwell, VII, Louie Zepfler, V, Hank Marion, VI, Charlie Williams, I, Howard King, I, John Little, X, Kebe Toabe, V, San Willis, III, Jim Tobey, IX, and Azel Mack, X. It was a jolly group with interesting discussions of our activities and families and good natured references to the proclivities of some of the absent classmates, a pleasant and happy evening for us all. The spirit and loyalty of our classmates shows the value of these friendly contacts as we grow older. The general feeling is that we hold our Twentieth Reunion alone and not combine with '16 and '17 for a big general reunion as was suggested recently. Also that unless an unusually large expense is entailed for our Twenty-Fifth that we make no plans now for an advance fund. Any other suggestions from you all I shall welcome.

At the request of Dr. Compton, Jim Tobey, IX, officially represented the Institute at some sort of ceremony at the

Long Island College Hospital Medical College, Brooklyn. Jim says he wore one of those dignified caps and gowns with impressive colored trimmings.

I haven't seen Frank J. Herlihy, II, for years, so I was very happy to meet him recently in Boston. He is Junior Master of Lewenberg School, Dorchester, Mass., and lives at 5 Chrisholm Street, Roslindale, Mass.

At the annual convention of the National Paper Trade Association at the Pennsylvania Hotel, New York, in February I saw Ken King, X, with du Pont Company, Chicago; Charlie Blodget, X, with A. P. W. Paper Company, Albany; and Allen Abrams, X, technical director with Marathon Paper Mills, Rothschild, Wis. During the meeting Allen was elected President of the Technical Association of the Pulp and Paper Institute. Congratulations, Allen. A nice job for you!

In answer to our class contribution of \$25.00 to the Advisory Council on Athletics, we received the following expressive note from Dr. Rowe: "Thank you very much for your note of the 26th with its welcome enclosure from the Class of '15. I greatly appreciate your interest to which I ascribe this earnest of the good will of the Class, and, equally, the support and sympathy which they evince in authorizing this contribution. As I have written you before, the support of the alumni, carrying with it tacit approval of the policies under which we are trying to operate the Institute athletics, is a great help to us and lends courage and assurance in their continuance. Please extend our formal thanks to the Class."

On the letterhead of T. G. Buckley Company, 690 Dudley Street, Boston, The Dorchester Fireproof Storage Warehouse, Francis E. Buckley, V, writes: "There is not much news to give you. On leaving school I entered this business of which I am now President and Treasurer. I am married and have one boy, Thomas G. Buckley, 2d, nine years old." Another engineer gone astray! — And so closes another month's notes. — AZEL W. MACK, *Secretary*, 379 Marlboro Street, Boston, Mass.

1916

My S.O.S. for news last month has not yet brought any replies, which is discouraging to say the least. I am pleased, however, to give the following item just received from Chuck Loomis: "I left Detroit just after Thanksgiving to take charge of our Memphis branch. My family is still in Michigan endeavoring to sell or rent my house. I have so far made no contacts through any local Technology organizations. If any such exist here, I don't know. I have been living at the University Club and probably would have heard of any activities of this sort if there were any."

"Have you any 1916 men in this part of the country? Our Memphis factory serves Tennessee, Arkansas, parts of Kentucky, Mississippi, Alabama, and Georgia and I will occasionally get out into these states with our salesmen so that I

will be glad to know of any of my friends who may be located in my path. I haven't any news that I can pass on to you for *The Review*. If, by any chance, you get into this part of the country, don't fail to look me up."

At the Annual Banquet held on February 6 at the Hotel Statler, Bob Naumberg, Steve Burke, and Jeff Robertson were the only ones present. It is too bad that more of our class don't turn out for these affairs for it would give us an opportunity of getting together at least once a year.

The *Boston Transcript* carried a formal notice on January 23 of the new firm of Richmond and Morgan. It gave the following write-up: "Isidor Richmond, winner of the Rotch prize in 1923, and now President of the Boston Architectural Club, has been in independent practice at 248 Boylston Street since 1925 and gives to the new organization talent of high order. — During the War, Mr. Richmond served as a pilot in naval aviation, stationed at Chatham and Pensacola." — HENRY B. SHEPARD, *Secretary*, 269 Highland Street, West Newton, Mass. CHARLES W. LOOMIS, *Assistant Secretary*, 7338 Woodward Avenue, Detroit, Mich.

1917

Congratulations to Captain Hegenberger are in order. The *Boston Globe* said the following about him recently: "Lieut. Albert F. Hegenberger, South Boston army flyer who navigated the big Fokker Army plane on its flight from San Francisco to Honolulu in June 1927, has been promoted to be a Captain in the Army Air Corps, according to orders issued by the War Department. The flyer is on duty at Wright Field, Dayton, Ohio. Honors of many kinds were showered upon Hegenberger and his pilot, Lieut. Lester J. Maitland, after they completed the 2,400-mile flight to Hawaii. They were fêted throughout the country; Boston gave them a celebration second only to Lindbergh's. But through it all both Hegenberger and Maitland modestly declined to become excited about their feat. It was just part of their job, flying for the Army, and they soon went back to their duties at the Army flying fields. Hegenberger attended Mechanic Arts High School in Boston and then went to M. I. T. It was at Tech that he became interested in aviation and he has been flying ever since."

The Danbury, Conn., *News* states that Carl Malmfeldt, a World War veteran with offices at 15 Lewis Street, Hartford, has been appointed consulting architect by the commission for the establishment of a soldiers' home. The appointment was made by unanimous vote of the commissioners present. Besides being a graduate of Technology, Carl holds a diploma from Harvard, and from the École des Beaux Arts. The *News* continues: "During the past ten years he has executed more than 2,000 commissions, among the most recent of which is the Hartford Steam Boiler Inspection and Insurance Company's new office building on Prospect Street in Hartford. He was also

1917 Continued

associated with Adams and Pentice in designing the new Hartford post office."

Of the various new items concerning Dutch du Pont's marriage, we present the following from the Boston *Transcript*. "Miss Janet M. Gram of Buffalo, N. Y., a former student at Pine Manor at Wellesley, and Francis V. du Pont of the well known family of that name in Wilmington, Del., were quietly married on Tuesday in Baltimore, Md. The bride, who is the daughter of Mr. and Mrs. Edward S. Gram of Buffalo, was a bridesmaid at the Baltimore wedding in 1928, of Miss Helen Martien and Lawrence B. Fenneman, recently appointed an assistant city solicitor for Baltimore. She was a classmate of Mrs. Fenneman at Pine Manor School. Mr. du Pont, who is head of the Equitable office building in New York and is identified with several financial and business enterprises, is a son of the late Senator Coleman du Pont. The bridal party motored to Baltimore from Wilmington for the ceremony. Governor Buck of Delaware, who is a brother-in-law of the bridegroom, and several other guests witnessed the ceremony which was performed by Rev. Martin Luther Enders in the First English Lutheran Church."

Richard O. Loengard, Jr., was born on January 28, 1932, and extended correspondence has already been carried on relating to his entry into Technology. It is understood that there is some discussion as to whether arrangements should not be made for his appearing at the Institute at rather earlier than the average age. Richard, Sr., however, is opposed to this move on the basis that he wants no infant prodigies in his family.

Your Secretary was not able to be present at the Alumni Dinner this year and so he has asked others to present the story as they see it. Various weird rumors have reached us, among them being word to the effect that the presence of ladies made it impossible for one or two members of some classes to enjoy the Dinner in their usual fashion, — 1917 was, in fact, mentioned. However, I have asked that one of the eye witnesses report the occasion and add it as a supplement to these notes. He advises that: "As usual 1917 was represented by a goodly number of members, none of whom exhibited the effect of the inhibitions to which your rumors allude. Nor were any '17 men (except one) visibly embarrassed by certain remarks which were interspersed between the felicitous sentences of a principal speaker. Two of our 'far-flung' electorate graced the occasion with their unannounced presence: Phil Cristal of Cleveland, and Bill Dean, who is also domiciled west of Hudson's River." — RAYMOND S. STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass.

1918

Glad news travels fast and by many routes. By Western Union, by personal letter, by newspaper clipping, by engraved announcement, and (if you must have further corroboration) by back-

stairs gossip heard at Mal Eales' bridge party comes the news that Pete Harrall is engaged to Miss Marie Barbara Smith of Englewood. Cheers! By the time this reaches you, linen and silverware may be addressed to 100 East Palissade Avenue, Englewood, N. J., Apartment C-22. Please omit stag handled carving sets.

My, my, how times does go. It's 13 years since we got those ads telling about complete furnishings for a three-room apartment, including an overstuffed set, all for \$269.50. And the gas company offers cooking in six tasty lessons at \$18.75 or what have you. One could write a 200-page thriller on love's minor frictions.

Mal Eales' bridge party mentioned above was an all Technology affair attended by Mr. and Mrs. Fuller, Robertson, Kennard, Longley, our Gretchen and ye Class Secretary, who sneaked in from the Newark Airport, notebook in hand, just in time for the refreshments. This grand concourse of '18 men naturally led to a discussion of ye coming Class Reunion. It was unanimously agreed that the Weekapaug experience of 1928 was superlative and that more of the same was in order. It was also unanimously agreed to memorialize the Secretary for failing to chronicle the party held last October by the Fullers. We stand corrected.

Albert Hertlein has been distinguishing himself in the civil engineering department at Harvard. The most extravagant statements have it that he is taking the place left vacant by the late famous Professor Swain.

We record with regret a serious automobile accident in which Clarence Timanus, on his way back from the American Water Works Convention in New Mexico, hurt a number of vertabrae. We also regret to report the news of the death of Raymond Newcomb, assistant sales manager of the Kewanee Boiler Company of New York City, as a result of an automobile accident on a business trip to Atlanta. Mrs. Newcomb was Hope Nichols of Course VII in the Class of '19. — F. ALEXANDER MAGOUN, *Secretary*, Room 1-305, M. I. T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, The Thomas School, Wilson Road, Rowayton, Conn.

1920

I have two important items of news regarding James I. Wolfson. First, that a son, Stephen Abel Wolfson was born December 20; and second, that Wolfson is now located at Rockaway Park, Long Island, the street address being 220 Beach 125 St.

Meylert Bruner is with the New York Port authority and we hope this means that he is getting a full share of the spoils.

Bob Davis of Course VI is now living at 27 Federal Street, Springfield, Mass. Larry Frost of the same Course is with the Brooklyn Edison Company, and Merton Hall is down in Houston, Texas. John Perkins has left California and is now in Washington, Conn.

The Class of '20 is certainly a bunch of white-hot enthusiasts filled with loyalty and pep. A day before the Annual Alumni Dinner, Professor Locke phoned me to say that Freddie Burton was the only '20 man who had signed up for the dinner. I could hardly suppress a smirk at the thought that it was the same group that could go month after month and year after year without so much as a kind word to their loyal, perspiring but prostrate secretary. HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

1921

Introducing this month our Boston correspondent for class news, Henry R. Kurth, who has kindly sent us news of the Annual Alumni Dinner and who, we hope, will continue to contribute notes regularly in the future. Chick is System Operator, Edison Electric Illuminating Company of Boston and is located at 776 Summer Street, South Boston. He and the Mrs. and the four little "Chicklets," two boys and two girls, make their home at 8 Healey Street, Cambridge. C'mon Gang, give our correspondent a big hand, — and also a lot of class news!

Chick takes his bows and then reports that he and Mrs. Kurth attended the Alumni Dinner of February 6th. Says he: "I had called up a number of '21 men prior to the banquet but could elicit no interest whatever. Attending the affair were the following three other '21 men: Algot J. Johnson, 277 Washington Street, Gloucester, who is in the Commercial Department of the New England Telephone and Telegraph Company, Boston. His card, as made out for me, read 'Not yet married' with the 'yet' crossed out! — Edwin R. Clark, 77 Magnolia Road, Swampscott, who is with the Lynn Gas and Electric Company. Ed reports the arrival of a daughter, Welthea A., on December 19, 1931. — Professor and Mrs. Fred W. Adams, who with their two boys, Fred, Jr., six years old, and Noel T., 19 months, reside at 34 Maple Street, Stoneham. Fred is Director of the Boston Station of the School of Chemical Engineering Practice of Technology's Department of Chemical Engineering. 'From Pulp to Paper' was the title of a series of four lectures which he recently presented before the American Chemical Society on the story of wood."

We note that Chick Kurth has also published a paper in a recent issue of *Edison Life* on the subject "Some Features of Interchange Power." This is an interesting account of the interconnection of the Boston Edison System with other large power companies and of the economies which result from the exchange of power between steam and hydroelectric systems.

News comes to us via Ray that Dick McKay has left the ever thinning ranks of the single and eligible. "Mrs. Ezekiel McCleary announces the marriage of her daughter, Ruth Isabel, to Mr. Richard McKay on Friday, January 22, 1932, Amsterdam, N. Y." Hearty congratulations and best wishes from all of us. Dick is associated with E. A. Pierce &

1921 Continued

Company, 45 Milk Street, Boston, who are members of the N. Y. Stock Exchange.

Stuie Nixon writes Ray from California and says, in part: "I have been out in this neck of the woods since last May and, thanks to Jack Kendall's efforts, I am beginning to like it. I have charge of the West Coast for Continental Motors and travel the whole thing from boundary to boundary. Beyond that I have little to say except that I am still not married nor in any hopes, as it is hard enough to keep one alive without having another to worry about."

Not since the days of his association with *The Tech* has M. K. Burckett strayed far from the printing or advertising fields. Max is now with the Erwin Wasey & Company advertising agency, Graybar Building, New York, N. Y., which numbers among its clients such nationally known advertisers as Camel Cigarettes, Goodyear Rubber, and Philco Radio. Max and Ethel and little Phyllis, who is now two years old, live at 28 Gates Avenue, Montclair, N. J.

It is with regret that we quote the following news of one of our classmates, sent through the kindness of Prof. C. E. Locke, Alumni Secretary: "We recently wrote to Jacob J. Balyozian, a member of the Class of 1921 and a graduate of Course XIV. The reply came back from his brother Nicholas Balyozian of the Class of 1916 as follows: 'My brother has been sick since 1923 with multiple sclerosis and is practically bed-ridden at present. It would be well for his class to be notified and do something to help cheer him up.'

"The address is 453 South Main Street, Mansfield, Mass. I am passing this information along with the thought that you will be interested in looking into the matter. You may find some of his classmates, especially in Course XIV, who are located near enough so that they can call upon him." — RAYMOND A. ST. LAURENT, Secretary, Rogers Paper Manufacturing Company, South Manchester, Conn. CAROLE A. CLARKE, Assistant Secretary, Bell Telephone Laboratories, Inc., 463 West Street, New York, N. Y.

1923

A dollar's worth of cigars brought to Johnny Sands, XIV, one perfectly good new, shiny Plymouth car. His was the 178th automobile awarded in the daily nation-wide contest of a certain five-cent cigar. Submitted for the December 23 contest, Sands won on the basis of the following timely slogan: "Last minute shoppers! Be wise. Cremos are certified, clean, fragrantly smooth, sensibly priced, easily procurable, highly acceptable. The ideal gift."

That seems to us to be an item of news, sufficiently important to lead off with this month. Sands is engaged in alloy steel research work, making his home in Staten Island, New York. He is married and has two children of which to boast. Of less news value, but more important, was an accident Sands experienced just recently when he was struck in the face by a heavy piece of steel. Fortunately he was not seriously injured.

Your Secretary has had to write these notes on several occasions while traveling and this is one of the times, these notes being written in Houston, Texas.

A note from Hal Beadle, X-B, reporting on his doings since graduation explains that after four years in California he returned to New England in sales engineering work for Tidewater Oil Sales Company and was subsequently appointed Boston District Manager in charge of direct and distributor sales. Bradford Beadle, now about one year old and also the son of Sjanna Solum of Syracuse, N. Y., is planning to attend the next class reunion.

A clipping from the Fort Collins, Colorado, *Express* tells of the engagement of Clara Louise Cleveland of Denver to Arthur L. Hill, II, who is an engineer for the Colorado Portland Cement Company of Denver. The wedding is to take place in the spring. Miss Cleveland is a member of the Denver Junior League and at one time attended Abbott Academy in Andover, Mass.

When I saw Frosty Harmon, X, in San Francisco last summer he was with the tubular goods department of the Columbia Steel Co., fifty-million dollar subsidiary of the U. S. Steel Corporation. Recent advices indicate that Frosty has succeeded to the job of sales manager. Congratulations are due anyone who can get a promotion these days.

Bill Tayler, II, has returned from Europe and is now in Westfield, N. J., with his wife and son. — Jim Brackett, XV, who spent several years in the Far East following graduation has, because of the current disturbances in that quarter, been in considerable demand for talks before various groups interested in first hand information on Far East problems.

I regret to have to note the death of Donald E. Lovell, VIII, on September 4 last in Schenectady, N. Y., of tuberculosis.

Received just too late for inclusion with last month's notes was an account from Pete Pennypacker of a bowling party staged by himself and Messrs. Charlie Mapes, VI, Rod Goetchins, VI, Jack Keck, X-B, Walt Marder, II, Johnny Sands, XIV, and Lew Tremaine, II, in New York on January 14.

Pete reports seeing Bobby Burns, I, who was just in from the West. Art Stuckey, I, he reports, is still in the field for Stone and Webster in Missouri. Bobby's plans included a brief stay in Philadelphia, a visit to his sister in Canada, and a two-months' furlough to visit his people in Ireland.

Pete sent in the following account of the 1923, 1924, and 1925 annual dinner dance:

The annual dinner-dance of the classes of 1923, 1924, and 1925 was held at the Army and Navy Club in New York City on Saturday, February 6. Those present included Charlie Mapes, Pete Pennypacker, Miles Pennypacker and Lem Tremaine of '23, G. H. Arapakis, R. N. Black, A. R. Gruehr, Bill Correale, Dick Lassiter, L. F. Porter, L. J. Porter, T. E. Simonton, Henry Shore, and H. G. Shea

of '24, and R. C. Gallagher, H. C. Sachs, and Sam Samuelson of '25. With their guests this made an attendance of about 40, somewhat lower than at previous years' parties.

Gruehr was official host and toast-master this year, assisted by Simonton and Tremaine. Black acted as leader in singing at various times during the evening.

The feature of the intermission was a sketch burlesquing the recent Culbertson-Lenz bridge match with the following cast: Mr. Cussherton, Simonton '24; Mrs. Cussherton, Mrs. Simonton; Mr. Cleanse, Tremaine '23; Mr. Jassoby, Pennypacker '23; Referee, Gruehr '24; A Radio Announcer, Mapes '23, and A Reporter, Black '24.

The match was announced to be for the purpose of settling the respective value of two systems of contract bidding, — the "Reproach-Bossing" system of the Cusshertons (designed for husbands and wives) and the "Cleanse or Superficial" system (for bachelors).

The play: Jassoby dealt, the score board revealing that each player had received a perfect hand of 13 cards of one suit! Jassoby with 13 clubs, opened the bid with a "psychic" 3 hearts. Cussherton with 13 hearts doubled. Cleanse with 13 spades bit 7 of that suit, being doubled by Mrs. Cussherton. Jassoby then bid 7 no trump which was doubled and redoubled. On his being set 9,800 points he was promptly shot by his partner, to which proceeding the audience could raise no valid objection!

Other stunts on the program included broom dances, Paul Jones', a Virginia Reel, cross word and jig-saw puzzle contests, and finally a desperate tiddely-wink race! The success of the occasion was largely due to the efforts of Bill Correale '24 who directed plans and acted as treasurer, and to Lem Tremaine '23 for the entertainment program. — HORATIO L. BOND, Secretary, 31 Concord Avenue, Cambridge, Mass. JAMES A. PENNYPACKER, Assistant Secretary, Room 661, 11 Broadway, New York, N. Y.

1926

Thrice again has death struck our ranks. On November 5, Lt. Commander Oscar W. Erickson, U. S. N., died after an accident aboard the U. S. S. *Saratoga*; and on February 9, Richard E. Connet of Providence, R. I., died after a prolonged illness. He graduated in Course II, and from September, 1927, until his death he was connected with the Venturi Meter engineering staff of Builders Iron Foundry in Providence. Your Secretary had the pleasure of announcing Connet's marriage in this column in 1929. While at the Institute he was on the staff of *The Tech*.

Edwin W. Southworth, Jr., of Winchester, Mass., died on February 15. He took Course IX-B while at the Institute. — To the family and friends of each of these men your Secretary begs leave to express the sympathy of the Class. We can ill afford to lose men like these. — Our necrology now contains 21 names.

1926 Continued

Mr. and Mrs. Irving R. Macdonald announce the birth of Dolina Morrow Macdonald on February 21. Mac has one other daughter named Lorna.

In the Olympic fencing tryouts held here at the Institute early in February, Jo Levis triumphed splendidly. His participation in the Olympics, barring catastrophe, is thereby insured. He merits the congratulations of all of us. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 11-203, M. I. T., Cambridge, Mass.

COURSE IV

Following a period of deafening silence, information regarding the former inhabitants of Rogers bursts forth. An informative letter from Tex Buenz (like an oasis on the Sahara to the news-thirsting reporter) states that he and Mrs. Buenz journeyed to Mexico City in September on their honeymoon, and his rhapsodic account of the beauty of that neighboring country in the autumn season kindles my desire to leave even the eternal springtime of Cincinnati. Tex is in San Antonio designing residences, ice-houses, libraries, schools, office buildings, and other unclassified structures of no less beauty. Visitors to San Antonio and the Buenzes have been: Homer and Mrs. Huntoon en route to California for a vacation; and Ernie Muhlenberg en route to West Texas, also on a vacation.

Don Homsey and his wife have been traveling in Europe for the past year seeing practically all countries. — Draver Wilson, working in California, went to Mexico City for the holidays, or at least, such was his plan. Draver has taken up lithography and, as might be expected, is making some beautiful drawings.

Esther Parsons was married on September 19, 1931 at 8 P.M. (same year, same month, same day, same hour as the Buenz wedding in San Antonio). The name of the fortunate man is not in my sheaf of notes. — Frank Roorda is now working in the office of Raymond Hood, New York City. — Bob Dean, working on the Williamsburg restoration project for Perry, Shaw, and Hepburn, has also been teaching third year design at Rogers. — Don Nelson distinguished himself in the Columbus Memorial Lighthouse competition. The design of Nelson and Lynch was awarded second place. Ed Lynch '25 collaborated with Nelson, doing the interior design.

Your Secretary is still at the University of Cincinnati awaiting news from members not yet heard from. — ALAN K. LAING, *Secretary*, School of Applied Arts, University of Cincinnati, Cincinnati, Ohio.

1927

COURSE XV

At the recent Annual Banquet of the Technology Club of New York at the new Waldorf Astoria hotel, there assembled a small group of '27 men, namely; Hon. Class President, James A. Lyles, Frank Crandall, Kenneth A. Smith, Ernie Hinck, and the writer. The subject of class news in *The Review* inevitably arose, whereupon the writer was com-

missioned to emerge from his position as Course XV Secretary and compile, compound, or manufacture some news for the next Review.

Incidentally, definite moves are being made under Jim Lyles' guidance to organize some plans for the Fifth Year Reunion of our Class in June. By the time this Review reaches you, you will no doubt have received a questionnaire requesting information as to whether or not you will come to the Reunion and when, where, and how it should be staged. It is sincerely hoped that in spite of the depression there will be a goodly turnout. Suffice it to say that expenses will be pared to the minimum, so don't let your pocketbook scare your class spirit.

The following notes regarding the whereabouts and doings of various members of the Class have come to me mainly via the grapevine telegraph. If any of this information should be erroneous, kindly remember that the writer has no means of checking its veracity.

Andy Anderson is still with the Monroe Calculating Company in Orange, N. J., and is now in charge of the cost engineering department. Here is one Course XV man who is following the tradition of the Department. — We have no news from Dike Arnold, but understand that he is still in the shoe business with his father somewhere in Massachusetts. Have also heard rumors that he is married. Don't be such a shrinking violet, Dike, let's have a word from you. Your old friends would like to know how you are getting on.

Saw Alf K. Berle at one of the recent '27 get-togethers in New York. At the time, he was connected with the Drama-graph Company in the industrial talking picture field. Understand, however, that he is now selling oil burners. Alf is married and living at Forest Hills, Long Island.

As you probably remember, Bob Bigelow married Helen of Troy (Ohio) while he was connected with the Hobart Company. He was shifted from Troy to San Francisco and eventually left the company to go with the United Shoe Machinery Corporation. Bob is now living in Beverly, Mass., according to latest reports. — Art Buckley is one of the few enterprising souls to start in business for himself. He and Andy Anderson were working together for the Monroe Calculating Machine Company in Orange, N. J. Somehow or other he ran across a little shoe repairing business that was having its difficulties as a result of poor management. Having had considerable experience in shoe manufacturing, Art contrived to take over the business and immediately set to work eliminating excess overhead. He does a real engineering job on any kind of foot-covering and is developing a good little trade. Art is married and recently had an addition to the family. I certainly wish him all kinds of success.

Joe Burley married Ruth Thomas of Brookline shortly after graduation. Joe is now the proud father of a baby girl named

Sally. He is busy keeping the Boston Insulated Wire and Cable Company up to scratch. Incidentally, Joe's company furnished all the wiring for the new *Akron* and also the elevator cables for the Empire State Building. We see him occasionally on his selling trips to New York.

Dick Cheney is still with the Hobart Company. He spent two years in San Francisco and while there managed to fall in love and was married a few days before his transfer to New York. Shortly after his wife joined him in New York, he was transferred again to Philadelphia and although I received a Christmas card from him, I do not have his address. Drop us a line, Dick, and let us know how you are getting on. — Haven't heard a peep out of Dyce Coburn since graduation, although we understand he is still with the International Harvester Company in Chicago.

The last Review contained news of Johnny Collins. I might also mention that Bud Fisher, Johnny's old side kick at the Institute, is also with the Standard Oil Company and living in Elizabeth, N. J.

Frank Crandall, better known as Deke, has turned out to be somewhat of a big shot. Frank was formerly connected with the Hageman, Harris Company doing building construction work in New York City. He is now married and living in Dobbs Ferry, N. Y., where he has his own construction business — building homes for wealthy suburbanites. Frank claims a payroll of 146 men, an office in the Daily News Building in New York, and a stenographer (blond?). You should have seen Frank at the Alumni Dinner all dolled up in a tall hat. The boy certainly looked prosperous.

Carl Davies is still hanging out in Charlestown, S. C. Have not heard from him in a dog's age. — Maurice Davies is still with Johns-Manville at Manville, N. J. Must be living at the plant as we seldom see him. — L. B. Cheney is reported in New York City with Mark Eidlitz in the building construction game. — Johnny Field is supposedly with the Southwestern Bell Telephone Company somewhere in Texas, but have not had a word from him since graduation. Perhaps he has been corresponding with Doc Rowe.

Understand that Jim Flagg is now in Russia on a two-year engineering contract with the Soviet Government. It sure would be interesting to hear how he is getting along over there. — Bud Gillies is still ace-high in aviation circles and an executive of the Grover Loening Corporation. He owns his own plane and does considerable flying although he is still as quiet and unassuming as ever. — Ray Hibbert is with the American Tar Products Company and has been transferred to Providence, R. I. Still looking for a permanent marital connection.

Charles Hurkamp was last seen at Hempstead, L. I., with the Curtiss-Wright Aviation Company. He was probably transferred to Buffalo when the Curtiss Plant was moved from Hempstead. I did have a wedding announce-

1927 Continued

ment from Charley several months ago. The wedding took place at Sleepy Hollow, Mo. Sounds like Hurkamp, doesn't it? — W. H. Hutchinson is happily married and living in Upper Darby, Pa. He is with the Dyestuffs Division of the du Pont Company and is selling in the Philadelphia territory.

Ralph Johnson is still in sugar engineering in Hawaii. Understand he is now superintendent of a plantation. Life should be mighty interesting in that part of the world right now, with murders, mimic warfare, and troops shoving off for Shanghai. — Ernie Hinck is married and living in Montclair, N. J. At present he is busy studying law, and that's worse than engineering when it comes to exams.

I quote an interesting newspaper clipping from Manila, Philippines, dated January 11: "The escape of two Army lieutenants from an airplane accident in mid-air at Nichols Field, near Manila, last Thursday, was learned here today. Lieutenant Frederick E. Glantzberg, piloting the machine, was struck and knocked unconscious by a weight trailing from a radio antenna suspended from another plane. With the machine out of control, Lieutenant Alvord V. P. Anderson, Jr., radio operator, jumped with his parachute. While he was landing safely, Glantzberg recovered consciousness and righted the ship just as it was about to crash. The pilot was seriously injured by the blow from the weight, but Army physicians believe he will recover." That sure was keeping the ol' head in place. Best wishes for a speedy recovery and many happy landings, Fritz.

Ray Leonard has been with the Pittsburgh Coal Company for some time. He finally chiseled his way into the position of New England Representative so is now living in Boston with offices in the Statler Building. Ray is married and recently joined the Proud Fathers Club. Nice going, Ray. — Good old Jim Lyles is just the same as ever. He is still with the Chase Harris Forbes Company in New York, and is actively trying to get the gang organized for the Reunion in June. Jim is married now and doesn't understand why he stayed a bachelor so long.

Dan Metzger is now in Buffalo, N. Y. He was with the Grinnell Company in Providence. Wonder if he is still playing round with Bruce Sherrill? How's for a line or two from you, Dan? — Frank Mesker is the proud father of David Warren Mesker. He is still busy putting Mesker Wrought Iron Sash on the map. I saw Frank about a year ago while on an extended sales trip. Coming East again this year, Frank?

Saw Bill Reed last summer while on his vacation. Bill is still single and with the American Tar Products Company in Pittsburgh. He and Warren Smith are both numbered among the "Tar Babies." — Anson Rosenthal started off in sales engineering with the Kresge Department Store in Newark (not the five and ten). The depression evidently lessened the need for engineering so Rosy is no longer seen in Newark. Understand he is devoting most of his attention to Park Avenue,

New York. — K. A. Smith is in the cost department of the Marc Eidlitz organization and is very much interested in the construction game. Saw Ken at the Alumni Dinner and got a little dope on a few of the boys from him. — Glenn Jackson and yours truly are still associated in the David Houston Corporation trying to work a little industrial engineering into the industrial real estate business. Glenn landed a short job with the Newton Die Casting Company at New Haven and was there for a few months installing a piece rate system in their plant. During his stay he dropped in on Ike Stephenson in West Hartford. Ike is still with the Pratt & Whitney Aircraft Company in the sales engineering division.

Glenn also gives me news of Dale Stetson. After a year in Europe and a stormy session designing sets for Paramount in Hollywood, Dale has settled down to married life. He is now living on Long Island and busy designing scenery for the big hits of Broadway. — Ed True is still with the Hobart Company in New York. He is in the New York office supervising sales. Ed married Miss Anna Eilertson about a year and a half ago. Haven't seen much of him since. Guess the old fireside and slippers feel pretty good at night, eh Ed?

Glenn Jackson chimes in again to say that he saw Ray Waller recently in New York. He is with the American Airplane Corporation somewhere on Long Island and still much interested in the Army Air Corps. — Rus Westerhoff is doing industrial engineering work with Ford, Bacon & Davis in New York. — Carl Whittier is now in Salem, N. J. He was recently transferred from the Marcus Hook, Pa., plant of the Congoleum-Nairn Company to their Salem plant where he has the position of chief works chemist. Understand this is practically the equivalent of production manager. Congratulations, Carl.

If some of you fellows would cash in with a penny postcard once in a while, I might be inspired to write oftener. — GEORGE C. HOUSTON, *Secretary*, 27 Burnett Terrace, Maplewood, N. J.

COURSE XV₂

Many members of the Class who knew Colin A. MacDonald will be sorry to hear of his death, due to an auto accident on July 30, 1930. He was living at his home in Saanichton, Vancouver Island, B. C., where his mother now resides.

I received a letter in December from Chungsoo Oh. He is with the American Corn Products Company in Pyengyang, Korea, as divisional superintendent. There are several other Technology men with him, but he did not give their names. — John Robinson spent two weeks at Aberdeen Proving Ground last summer, along with Don Ross, VI, and Al Tarr, VI, and the writer. We met Technology men from several other classes along with Major Summers who is in charge of ordnance instruction at Technology. Ross is with Westinghouse in Springfield, Mass.

Len Riley is back in New Haven studying at Yale Graduate School, majoring in geology after spending four years in the Colorado mining. Len is married and has a daughter, Alice, now two years old. — Larry Cheney is with Marc Eidlitz Construction Company and is busy putting up new buildings for Yale University.

As for myself, I am electrical engineer with G. E. at Bridgeport, Conn. I am engaged to Miss Carolyn Clark Kadde-land, Vassar '28, of Shelton, Conn., and expect to be married in the fall. I would like to hear from classmates in this section. — CHARLES C. SMITH, *Secretary*, Great Oak Farm, Orange, Conn.

1930

First of all we have word that Chuck Habley has followed Cantor's advice. The lucky lady who will have the job of showing that two can live as cheaply as one is Miss Harriet Church of Berwyn, Ill. — Word has come to us of the engagement of David Stanley to Miss Adelaide Prentiss. No date has been set to our knowledge.

Bob Phelan writes as follows: "Another country heard from. I have been reading *The Review* and so came to writing to you, which I should have done long ago. I might as well tell you what I have been doing and get it over with. Last spring before I got through school and last summer I worked as bacteriologist for the now defunct shell-fish treatment plant at Scituate, Mass. Here I had the experience of equipping and getting into operation a routine bacteriological laboratory. The work was simple after it was started, and after I had been there for three months I was fortunate enough to get another job.

"Between jobs I took the opportunity to get a last, long vacation. I got the months of August and September. October first I went to work for the Atlantic Gelatin Co., Inc., of Woburn, Mass. This Company is a part of General Foods. Here I have done most everything from Lab work to help get out orders, including some time in the plant. . . .

"Last Christmas time I saw Herm Botzow in Jersey. We had a swell, long talk and I got a lot of dope on the Chemists. Herm, himself, looks fine although he is supposed to be recuperating from that illness he had in Germany last summer. On the same trip I saw Ed Hawkins in the Grand Central Station. This was the morning after Christmas. I believe he was leaving that day for Bermuda on that construction engineering job he has had for some time. He didn't seem to mind going to Bermuda for the rest of the winter.

"A few days ago I got a rush letter from Chuck Ladd. He wanted one good reference book on a variety of subjects coming under the headings of Bio-Chem, Bacteriology, Mycology, Pathology and others which I suppose a chemist doesn't know the difference between. He is now with a patent law firm in New York. From the sound of his letter he has a very interesting job.

1930 Continued

"The following men are doing as follows: Jim Morton, Course XVI, is in his last year at Harvard Business School, getting the finishing touches on how to make a million in the market in a hurry. Dick Foster, Course VII, has a good job as chief bacteriologist at the Whiting Milk Company's laboratory in Providence. — Wally Tibbets, also VII, is a research assistant at the Institute doing Vitamin studies on frozen food products of the General Foods Corp."

We also hear that Howie Gardner is now working on nitro-cellulose production for Eastman Kodak. It would help things quite a bit if some of the Course X members put some of said nitro-cellulose under Howie's chair so that he would wake up and send in some news of the gang. He is now living in Apt. 205, 1126 Dewey Ave., Rochester, N. Y.

I hope that others will send in news of themselves and their friends. Every little bit helps. — MORELL MAREAN, *General Secretary*, 1239 Norwood Ave., Niagara Falls, N. Y.

COURSE VI-A

The most important bit of news is, unfortunately, not too fresh. The marriage of George W. Schaible to Miss Dorothy Evelyn Weagle took place in Cambridge, October 17. George is now living with his wife in Albany and working industriously for the New York Telephone Company. If George doesn't answer his letters, further news may have to be manufactured.

I spent an enjoyable afternoon and evening recently at Steve Prendergast's place in Westfield, N. J. Steve is staying at the Arundel Club, composed of a group of college men representative of what seemed like dozens of colleges to me. Prendy tells me that Ray Bomley has a job with the Boston Police Department surveying police communication systems in all the principal cities in the East with a view to procuring the most suitable system for Boston. I also learned that Charl Cillie has blossomed out with a new Chevrolet. Good work!

A rumor is about that every VI-A man in the Class of '30 has a job. So far as I know, that is true. — E. D. Goodale is at present working for Mr. Eshbach of the A. T. & T. on a special survey of educational institutions in and around New York City. This past summer Goodale had some interesting flying experiences to tell me about.

I visited Frank Burley and his wife in W. Collingswood, N. J., not long ago. I found him very interested in his work on receiver research at the R. C. A. — Victor Company. I saw William Wannamaker, too, and actually rode in his old Ford that he is already open to offers for. Both of these boys are taking a terribly high mathematics course on electro-dynamics evenings at the University of Pennsylvania. My hat is off to them.

I understand that George Theriault is doing groundwork at Fleetwings, Inc., Roosevelt Field. I have not heard from or seen William Brewster Lodge. Rumor hath it, however, that Billy Lodge is in-

stalling wave traps for the folks who don't like to listen to WABC all the time. This was necessitated by the installation recently by the Columbia Broadcasting System of a new 50 k.w. transmitter. — EARL E. FERGUSON, *Secretary*, 317 West 56th Street, New York, N. Y.

COURSE XIII

Willie Ulcher and D'Antoni have both written from New Orleans. They are working together on the very interesting conversion of two war-time destroyers into Diesel fruit boats for the Standard Fruit Co. Two have been converted and their economy of operation speaks well for the work of Willie and Dan. The last named is treasurer of the Equitable Equipment Company of New Orleans and rumor has it that he is engaged, although the name of the lucky lady has not been divulged.

Willie is a land-lubber again, for the present at least, and after seven months spent observing the operation of the Ingersoll-Rand factory, in Toledo, has attained the high sounding title of Maintenance Engineer for the oil engines of the Standard Fruit Co.

The current issue of "Marine Engineering and Shipping Age" announces the awarding of a contract for 20 barges to Dan's firm, so things should be busy for a while down in New Orleans.

The rest of the course are living around Boston. Al Bird is back at the Institute doing graduate work in ship operation and engineering administration. — Jim Bryant is living out in Woburn and is selling insurance of all kinds in Boston. Your Secretary is still with the Bethlehem Shipbuilding Corp., in Quincy, and at present is assistant to the Way Foreman in charge of the scout cruiser *Portland*. — Johnny Booth and Ken Campbell of '29 are with me. — Otis Sibley tried his hand at shipbuilding this winter, but an excellent opportunity presented itself in New York, and I understand that he is now in the advertising business there. — Mouradian received his degree last June, but he, Jim Tyson, and Turnbull are among the missing as far as their doings are concerned. Let's hope they read this and send in something about themselves. — PARKER F. STAARATT, *Secretary*, 30 Westcott Street, Malden, Mass.

1931

A letter from Maurice Sellers tells us that: "Corkum, Seelye, and myself are helping to build the best ships that can be built, which is, of course, at no other place than the Newport News Shipbuilding and Dry Dock Co. Corkum is doing hull designing while Seelye and I are working a hot slip-stick in the Hull technical department. Being New Englanders, it was hard at first to 'catch on' to the South, but things are shaping up well now. In fact, it really is a hot place in more ways than one. I always thought that most of the corn was out Iowa way, but you should come to Virginia."

To keep up a rather fine record, two engagements have been announced this month. Mr. and Mrs. G. J. Guthrie

Nicholson, of New York and Newport, have announced the engagement of their daughter Miss Mary Elliot Nicholson to Phillip W. Bourne. — And Mr. and Mrs. David Barnett Swem, of Brooklyn and Sea Cliff, L. I., have announced the engagement of their daughter, Margery, to Frederick Van Cleft Branch.

Sam Garre is working with the Mudgett Cork Corporation in New York City, making estimates and plans for cold storage insulation. — Bubi Jessen has recently exhibited sketches made in England, on the Continent, and in and around Boston. — Louis Page, at the same time, exhibited sketches made in the vicinity of Fontainebleau and the Chateau country. Wilfred Jones is taking up work in the mining districts of Illinois, after having spent some time studying conditions in West Virginia and Kentucky mountains. — JAMES B. FISK, *General Secretary*, 4 Story Street, Cambridge, Mass.

Atlanta Alumni Association of the M. I. T.

This season of the year always carries with it an event which is cherished by the Atlanta Alumni Association, — the annual formal dinner and ladies' night. On Friday evening, February 12, the event was enjoyed by a gathering of 16 at the East Lake Country Club.

During the dinner the retiring President, W. R. Smith, laid before the group the task of electing officers for the coming year. This task is taken very seriously by the local section, so many timely speeches and pertinent remarks relative to the proposed candidates were offered in a valiant effort to remove from the organization all semblance of vile political corruption. After due deliberation and the valiant support of the ladies present, the following ticket prevailed: T. E. Moodie '24, President; O. R. Etheridge '26, Secretary; and A. K. Adams '06, Sergeant-at-arms.

Following the dinner the resourcefulness of the gathering furnished delightful entertainment well into the evening when the meeting closed with the singing of airs dear to M. I. T. men. Those in attendance were: Mr. and Mrs. A. K. Adams ('13), Mr. and Mrs. W. E. Huger ('22), Mr. and Mrs. T. E. Moodie ('24), Mr. and Mrs. W. J. Sayward ('01), Mr. and Mrs. W. R. Smith ('21), Mr. and Mrs. L. H. Turner, Miss Smith, C. A. Smith ('99), Miss Ruby Sheppard, and O. R. Etheridge '26. — OLIVER R. ETHERIDGE, '26, *Secretary*, Georgia Power Company, Electric Building, Atlanta, Ga.

Technology Club of Chicago

Our annual dinner was a fit celebration of the appearance of our directory of local members. The directory is also a monument to the hard work of Ross Sampson '13 who assembled the data. Our new officers were then elected to serve the season of 1931-32: President, John Alden Plimpton '22; Vice-President,

Ross D. Sampson '13; Treasurer, Bradley Williams '21; and Secretary, Lloyd C. Cooley '11.

The Chicago Rotary Club having as speaker at one of their luncheons, Stuart Chase '10, invited the officers of the Chicago Technology Club, but unfortunately only one of us could attend, so Williamson '10 and your scribe managed to help Chase review some of the old days at Technology and in Newton. During the dinner we discovered Charley Belden of Tech Show fame at a table near us — a mighty pleasant surprise.

Our winter season began with a rousing reception to Dr. Samuel C. Prescott, who arrived in Chicago shortly after Dr. Stratton's death, and who filled our great need of someone to speak of Dr. Stratton's wonderful work for M. I. T. Dr. Prescott made us realize how little we knew of what Dr. Stratton had been doing.

Visiting Alumni are urged to call up Lloyd C. Cooley, Randolph 0743, to learn the location of the weekly Technology luncheons, which for the next few weeks will be held at different places in the Loop in order to try to reach a more accessible location. — LLOYD C. COOLEY, '11, Secretary, F. J. Stokes Machine Company, 307 N. Michigan Ave., Chicago, Ill.

Technology Club of Fall River

Twenty-five members of the local Technology Club enjoyed an outing Saturday afternoon, January 16, at the Mt. Hope Estate of President R. F. Haffenreffer, Jr. The program for the afternoon included dinner, an entertainment, and then a visit to Mr. Haffenreffer's famous museum of Indian relics.

The party met at the Quequechan Club and made the trip to Mt. Hope by auto. They were welcomed by Mr. Haffenreffer at the log cabin on the shores of the bay, and there dinner was served. Music and short talks were followed by an exhibition of sleight of hand, the outing coming to a close with a visit to the museum, where an entertaining talk on Indian lore was given by an Indian Chief, Oshemekin. President Haffenreffer was given a vote of thanks for his hospitality, before the members of the club left for home.

The following members were in attendance: R. F. Haffenreffer '95, R. H. Gee '20, C. H. Warner '89, A. D. Nute '17, J. E. Nute '85, E. M. Fell '30, M. L. Sperry '00, M. D. Sullivan '31, H. F. Shea '21, J. W. Derrig '25, A. H. Andrews, A. E. Hirst '13, Philip Caplain '22, H. W. Smith '22, R. D. Stuart, Jr. '22, H. A. Lockhart '23, C. N. Borden '89, R. C. Ashworth, Jr. '25, A. J. Nakos '25, C. E. Trafton, G. H. Eddy '75, J. S. Coldwell '19, D. S. Owler, J. A. Carvalho '28, and J. R. Bonner. — ALDEN D. NUTE '17, Secretary, 914 Highland Avenue, Fall River, Mass.

M. I. T. Association of Cleveland

The Cleveland Alumni Association held its annual meeting on Wednesday, January 27, and elected the following

officers for the ensuing year: President, Howard W. Green '16; Vice-President, Charles H. Reed '20; Secretary, H. Seymour Colton '21; and Treasurer, Henry G. Steinbrenner '27. Hall Kirkham '23, retiring secretary, reported on the activities of our Cleveland Association for the past year, and it was unanimously agreed that 1931 was the most successful of recent years.

We have tried to make our gatherings for 1931 as attractive as possible, and with this in mind, our Association has met only when it was possible to present a program of real interest. The first meeting of the year was on April 9, when Colonel Leonard P. Ayres gave us a very interesting talk on his experiences during the war.

On May 8, we were especially fortunate in having Dr. Karl T. Compton, President of the Institute, address us at a dinner meeting at the Chamber of Commerce. For the evening we had as our guests a number of the alumni from the Akron Club. — On August 22, an outing was held at Dover Bay, which was decidedly informal and characterized by baseball, golf, and other amusements. — On September 11, the Akron Club invited us to a joint supper meeting on the lawn of President Litchfield's home, after which we were taken to the Air Dock to personally inspect the dirigible *Akron*.

Our final and annual meeting was held January 27, when Professor S. C. Prescott '94 was in town so that we might hear his very interesting talk on Frozen Foods. Professor Prescott's company and after dinner talk were greatly enjoyed by everyone attending the meeting, and we all left feeling better informed and in more intimate touch with the present Institute activities. — H. SEYMOUR COLTON '26, Secretary, 3290 Redwood Road, Lakewood, Ohio.

Technology Club of Puget Sound

The Technology Club of Puget Sound held a dinner meeting February 9, at the Faculty Club, University of Washington. We had 22 members present, five of these being from the University faculty. For entertainment Dean R. G. Tyler '01 ran off several reels descriptive of his tour of Europe last summer.

In the business meeting election of officers was held, and James Weldon Pratt '23, of the Pacific Telephone and Telegraph Company, was elected President, and Professor Joseph Daniels '05 was elected Secretary and Treasurer. — W. SCOTT MATHESON, '99, Retiring Secretary, 813 Gwinn Street, Seattle, Washington.

Washington Society of the M. I. T.

Colonel Frank L. Locke '86 was a guest of the Society at its regular luncheon meeting on Friday, February 19, at the University Club, and his formal talk on "The Three M's at Technology" was followed by a lively discussion on varied topics with respect to which it was assumed that he would have information.

The mysterious title of Colonel Locke's address brought out a substantial number of the alumni, and it turned out that Colonel Locke's talk related to the improvement of management at the Institute, the improvement of material, and the present effort to improve the methods of teaching.

As a prelude to his discussion of each of these points Colonel Locke gave the Society a résumé of the pertinent parts of President Compton's recent report to the Corporation, and in the course of his talk he treated with the steps being taken to improve the administration of the Institute and eliminate duplication in departmental work; the present efforts to eliminate misfits from the student body at an early stage in their career so that the material to be dealt with in the upper classes will be improved; the part the Alumni should play in arousing the interest of the right kind of men and advising those who would obviously be misfits to strive for top rank in the station for which they are fitted, rather than to be mediocre engineers; and the present attempts being made to consolidate courses and options in the early years and eliminate unessentials from the curriculum which, together with the honor group system, is expected to materially improve the methods of teaching.

The discussion following the formal talk was initiated by questions from Mr. Marsh, Mr. Dougherty, Major Holcombe, Dr. Tyler, and the Secretary and dealt largely with the placement work of the Division of Industrial Cooperation, the manner in which the Washington Society might assist in this connection, the comparative unemployment in the several classes and courses, which, with the exception of the most recent members, was found to be practically uniform at 3% or less, and the benefits expected from cooperation of the Honorary Secretaries with the alumni groups in connection with the regional scholarship awards.

All of those who were present were surprised to find the wide range of information still to be imparted after the recent visit of the "four horsemen" and congratulated Colonel Locke upon his ability to disclose so much without duplicating their efforts.

Incidentally if any of the Alumni know of an opening near Washington in the chemical engineering line for a graduate of the Class of 1923 who is experienced in lime, paper making, and water purification industries, the Secretary of the Washington Society will be pleased to receive the information and pass it on to the said graduate.

Among those attending the meeting were the following: H. C. Morris '00, W. M. Corse '99, J. W. Clary '96, W. C. Dean '00, E. D. Merrill '09, G. E. Marsh '02, Dwight Clark '97, B. E. Sherrill '27, C. B. Allen, Jr. '29, Nathan Howitt '30, A. E. Hanson '14, Proctor L. Dougherty '97, Honorary Secretary Washington District, Katharine Buckingham '27, A. B. McDaniel '01, A. W. Higgins '01, F. A. Hunnewell '97, J. C. Short '09, Paul Weeks '02, H. W. Tyler '84, F. H. Newell '85,

George A. Ricker '86, Francis G. Wells '22, John Ade Plugge '29, William E. Lutz '18, John D. Fitch '24, Robert H. Kean '23, George M. Tapley '24, Charles Bittinger '01, W. I. Swanton '93, Joseph Y. Houghton '26. — JOSEPH Y. HOUGHTON '26, *Secretary*, 402 Shepherd Street, Chevy Chase, Maryland.

The M. I. T. Club of Western Pennsylvania

On January 25, the club held its second monthly dinner meeting of the season at the University Club, Pittsburgh. The guest speaker of the evening was Lieutenant Joseph F. Battley, executive officer of the Chemical Warfare Service, Pittsburgh District, U. S. A., who spoke on "The Organization and Functions of the Chemical Warfare Service." Lieutenant Battley expressed the indebtedness of the Chemical Warfare Service to M. I. T. and her Alumni for assistance during the War and in peace time. The war development of the Service, including the construction and operation of Edgewood Arsenal, he stated, was largely due to the efforts of Col. W. H. Walker, Dr. Lewis, and a large number of other officers from M. I. T. In addition, the first and only R. O. T. C. unit of the Chemical Warfare Service is located at M. I. T., and a large proportion of reserve officers of the Service are Technology Alumni.

During the War, stated Lieutenant Battley, the principal achievement in Chemical Warfare was the construction and operation of Edgewood Arsenal by Col. Walker and his staff. This plant, which cost over \$40,000,000, attained such a state of efficiency in 1918 that it produced more gas than the entire Allied forces. In connection with the arsenal there were built also large shell-filling plants for heavy service. After intensive laboratory research, "Lewisite," a powerful war agent, was developed by Dr. Lewis and the men associated with him.

Lieutenant Battley discussed the application of the three principal gases to warfare: mustard gas, phosgene, and CN. He said that the primary aim in their use was to render a temporary casualty, since each casualty in the enemy's ranks required the services of several additional men to care for him. In this way a maxi-

mum number of the enemy's men were removed from combat. For effectively withstanding warfare gases, the Chemical Warfare Service has also developed a universal type of gas mask and protective clothing. It was of interest to the members of the Club to learn from Lieutenant Battley that R. E. Zimmerman '11, one of the Club members, was instrumental in developing some of the early gas masks used by this country in the war.

The principal portion of Lieutenant Battley's address was on the peace time organization of the Chemical Warfare Service and the building up of a comprehensive engineering and economic plan of coordination with industry. Under Lieutenant Battley's direction in the Pittsburgh area, a study has been carried forward of the principal industries capable of assisting in the Chemical Warfare program. A detailed survey has been made of the plants, equipment, processes, sources of raw material, costs, and many other factors necessary for an intimate knowledge of each industry. With the cooperation of the industrial managements, plans have been prepared for an efficient mobilization and coordination of all industries required in meeting the Chemical Warfare requirements.

Following the completion of Lieutenant Battley's address, the toastmaster announced that Mr. Maurice R. Scharff '09 and Mr. R. E. Zimmerman '11, both past Presidents of the Club, were expecting to leave Pittsburgh in the near future. In response, Mr. Zimmerman, better known here as Rufe, distinguished himself by another of his famous impromptu speeches. A toast was drunk to Mr. Scharff in recognition of his numerous efforts on behalf of M. I. T. — as President of the Club, as President of Technology Clubs Associated, and as Term Member of the Corporation. — SAMUEL J. HELFMAN '24, *Secretary*, Duquesne Light Company, Pittsburgh, Pa.

The Technology Club of Cincinnati

Early in February, J. D. Cochrane, Jr. '23, President of the Technology Club of Cincinnati, called into executive session the several members of the club, O. L. Bardes '21, C. R. Bragdon '07, R. H. Green '21, H. D. Loring '07, S. R. Miller

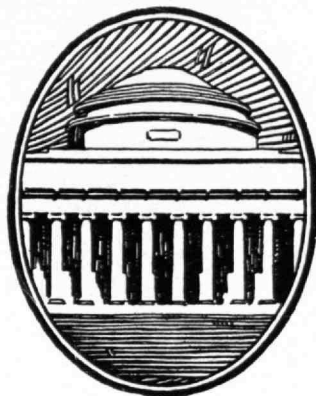
'07, and W. V. Schmiedeke '12 from which meeting came the following announcement:

"The Annual Dinner Meeting of the Technology Club of Cincinnati will be held Thursday, February 25, at the University Club. Dinner will be served at 6:30 P.M. when the party's entertainment will get under way, under the guidance of our social committee *extraordinaire*, headed by the inimitable Rudolph Tietig '98. The ladies are especially invited to participate in the evening's festivities which will be arranged for their specific enjoyment by America's foremost specification writer.

"The club chef has been oath bound to produce his *chef d'œuvre* (and it will be no boiled dinner). As the party will be strictly informal, there will be no boiled shirts (except for sketching purposes). An evening of care-free enjoyment is planned; however, there will be a nominal contribution of \$1.75 per plate for the overhead relief fund."

This was followed by a postscript: "Dr. Tryon of the M. I. T. Staff will be in Cincinnati, Monday, April 18, when one of our special meetings will be arranged to make him welcome. Mark the date on your calendar, for you will want to meet this famed traveler, this coast to coast contact man of the Technology Clubs."

The annual dinner and the ladies' night always prove interesting affairs and about 30 men and their ladies are expected to attend. The election of officers will be the only business of the evening. We had hoped to have one of the Institute Staff with us to round out our program. Disappointed in this, however, we obtained the assurance from Cambridge that Dr. Tryon would be with us in the spring, which offers us another occasion for one of our stag parties as mentioned and dated above. On these occasions the men from the outlying districts come in to swell the number of those located in the heart of the city who are the regular attendants of our Tuesday luncheons at the Hotel Gibson. Our luncheons, by the way, are maintaining their popularity right through the depression which meets here an effective repression in Technology fraternity. — WILLIAM V. SCHMIEDEKE, '12, *Secretary*, The Penker Construction Company, 1030 Summer Street, Cincinnati, Ohio.



INFORMATION

THE TECHNOLOGY REVIEW BUREAU exists to supply authoritative information to anyone interested in details regarding the Massachusetts Institute of Technology. It serves as a clearing house for inquiry and aims to further the spread of exact information regarding entrance requirements, outline of courses, subjects of instruction and other information which may be of aid to the students considering undergraduate or graduate study at the Institute.

The Institute publishes a variety of bulletins, fully descriptive of individual courses, as well as a catalogue of general information essential to the entering student. The Technology Review Bureau will be glad to send, gratis and post free upon request, one or more copies of any publication listed below, or to forward any special inquiry to the proper authority.

Ask for the following circulars by their descriptive letters:

AB: For general information, admission requirements, subjects of instruction, ask for Bulletin AB.

C: For announcement of courses offered in Summer Session, ask for Bulletin C.

D: For information on Advanced Study and Research Work, ask for Bulletin D.

E: For the reports of the President and of the Treasurer, ask for Bulletin E.

Y: For a popularly written explanation of Engineering Courses, ask for Bulletin Y.

All inquiries sent to the address below will receive prompt attention

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